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Title: Pit and Crack Detection Summary Report  
FY15\_DE07\_SW\_C1\_Zone\_1\_&\_2\_Section\_b

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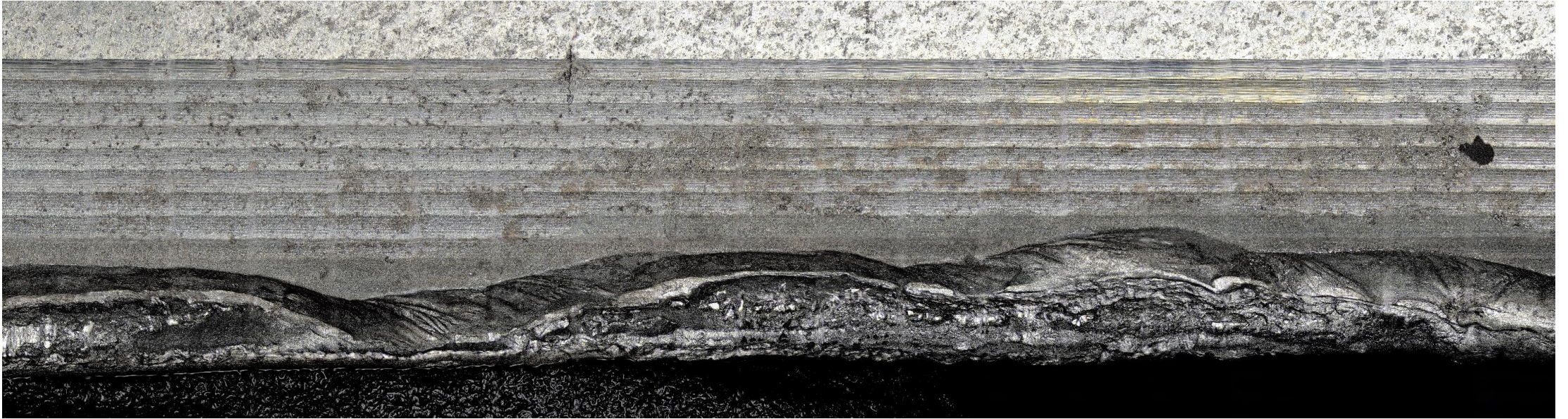
# Pit and Crack Detection Summary Report FY15\_DE07\_SW\_C1\_Zone\_1 \_&\_2\_Section\_b

James G. Wendelberger

CCS-6

02-Apr-2019

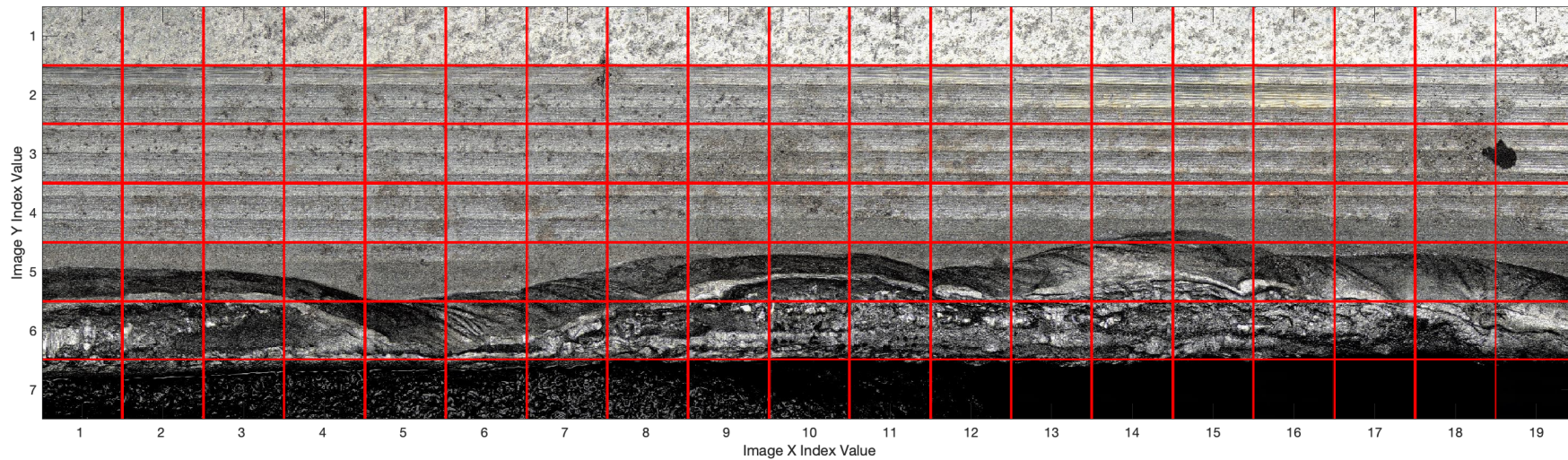
# Laser Confocal Microscope Visual Image FY15\_DE07\_SW\_C1\_Zone\_1\_&\_2\_Section\_b





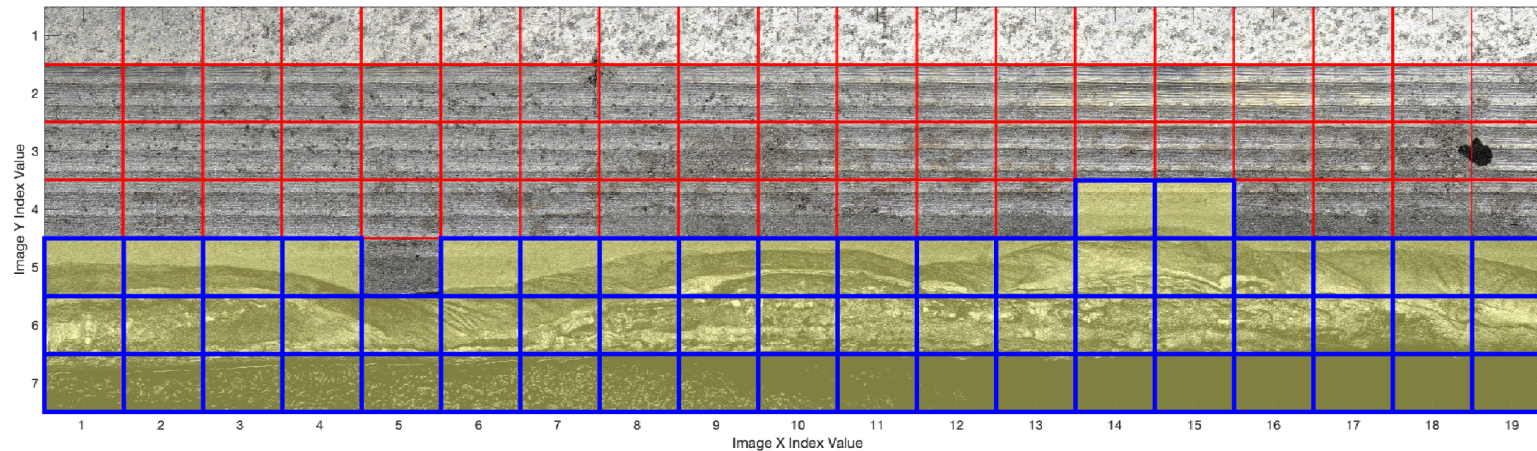
# Visual Image with Image Grid Overlay

Y Downward 1:7 & X Rightward 1:19



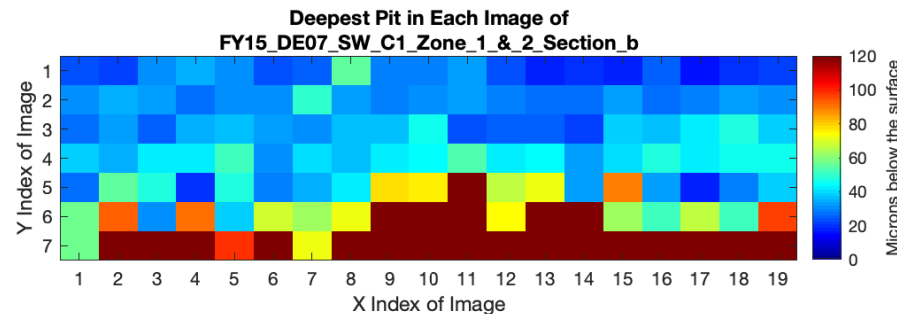
# Visual Image with Image Grid Overlay

## Yellow Shaded Image(s) Excluded

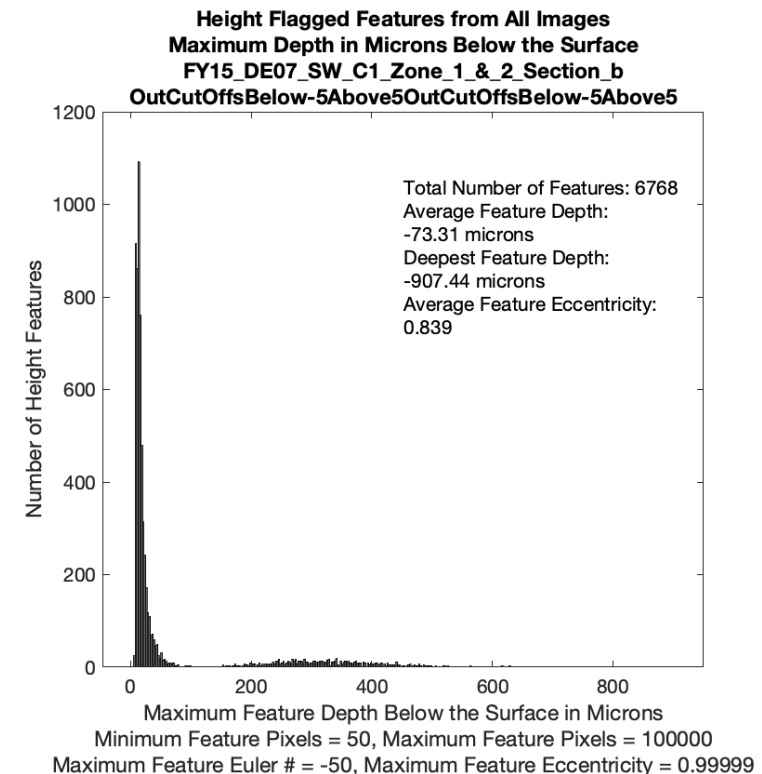


# Height Data - Summary for All Images FY15\_DE07\_SW\_C1\_Zone\_1\_&\_2\_Section\_b

## Pit Depth YX Index Key



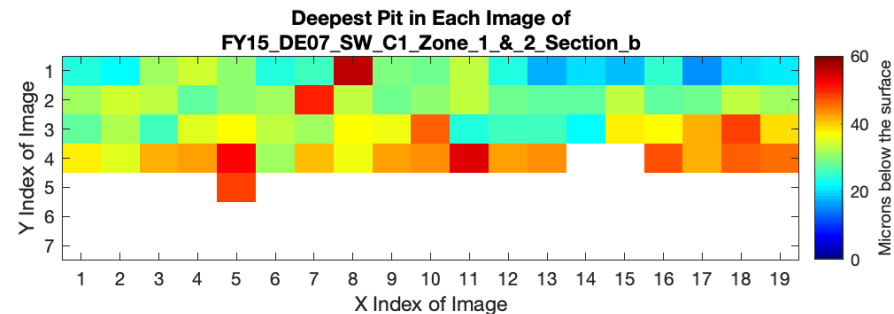
## Pit Depth Histogram - All Images



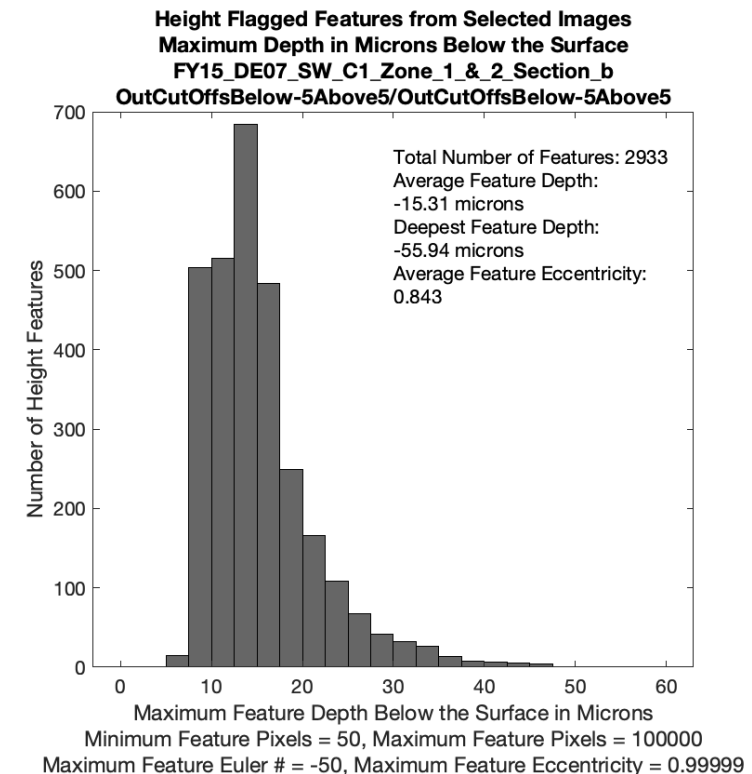
# Height Data - Summary Selected Images

## FY15\_DE07\_SW\_C1\_Zone\_1\_&\_2\_Section\_b

### Pit Depth YX Index Key

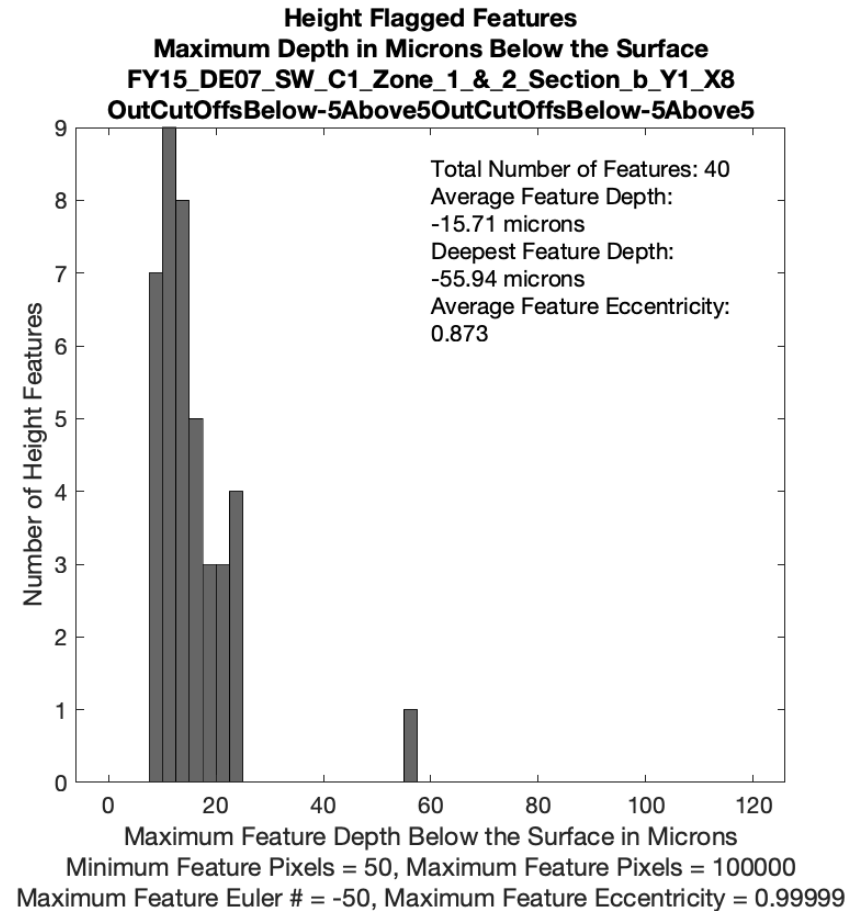


### Pit Depth Histogram - Selected Images



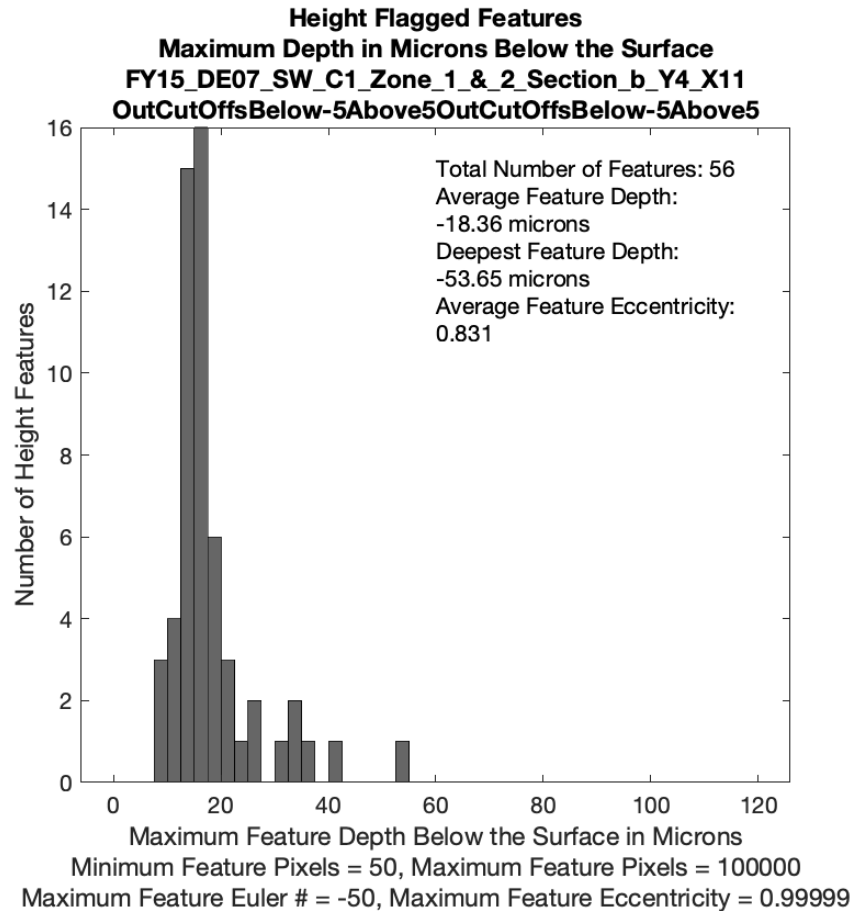
# Pit Depth Y1X8 Histogram Height Data

## Deepest Pit Ranking: 1



# Pit Depth Y4X11 Histogram Height Data

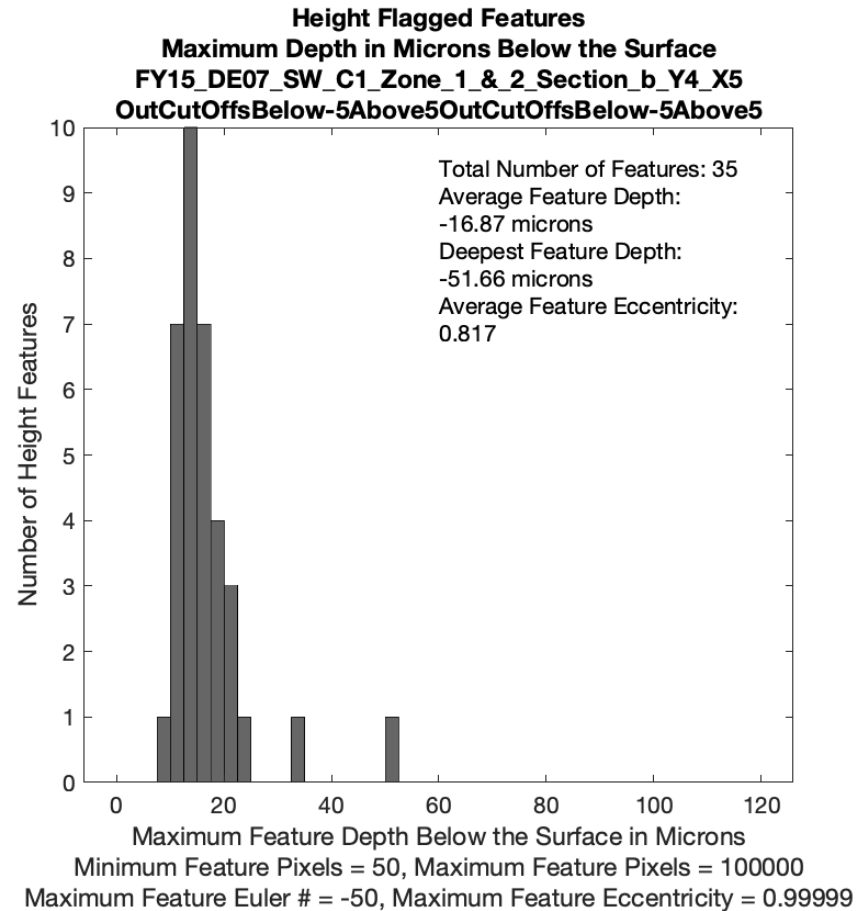
## Deepest Pit Ranking: 2





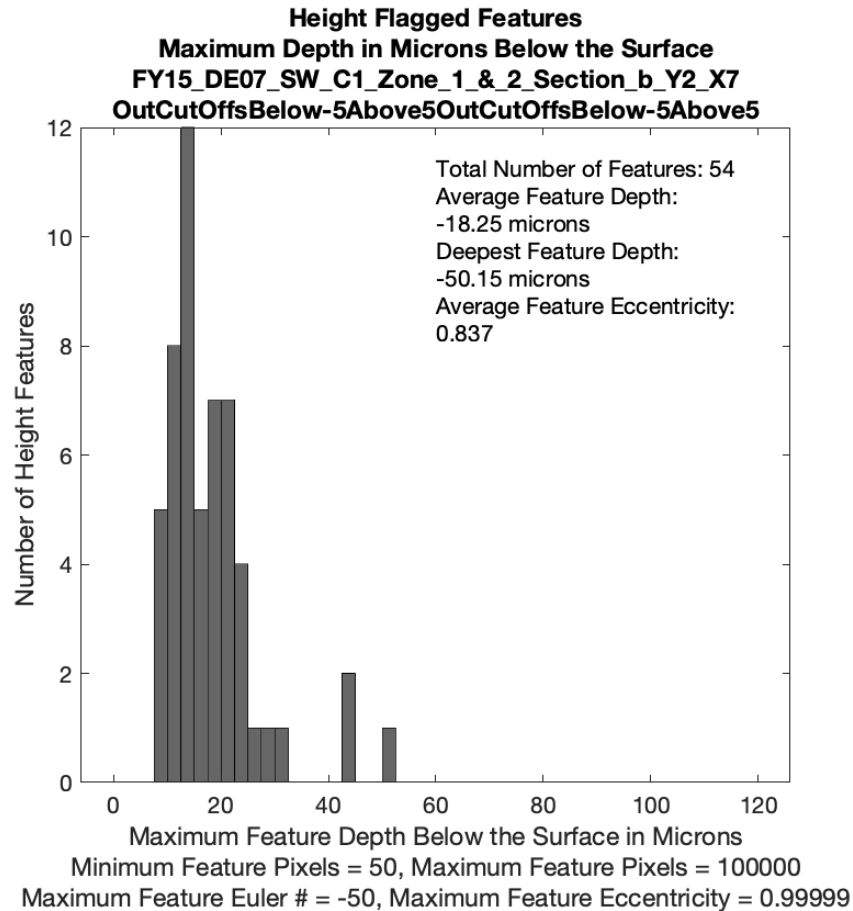
# Pit Depth Y4X5 Histogram Height Data

## Deepest Pit Ranking: 3



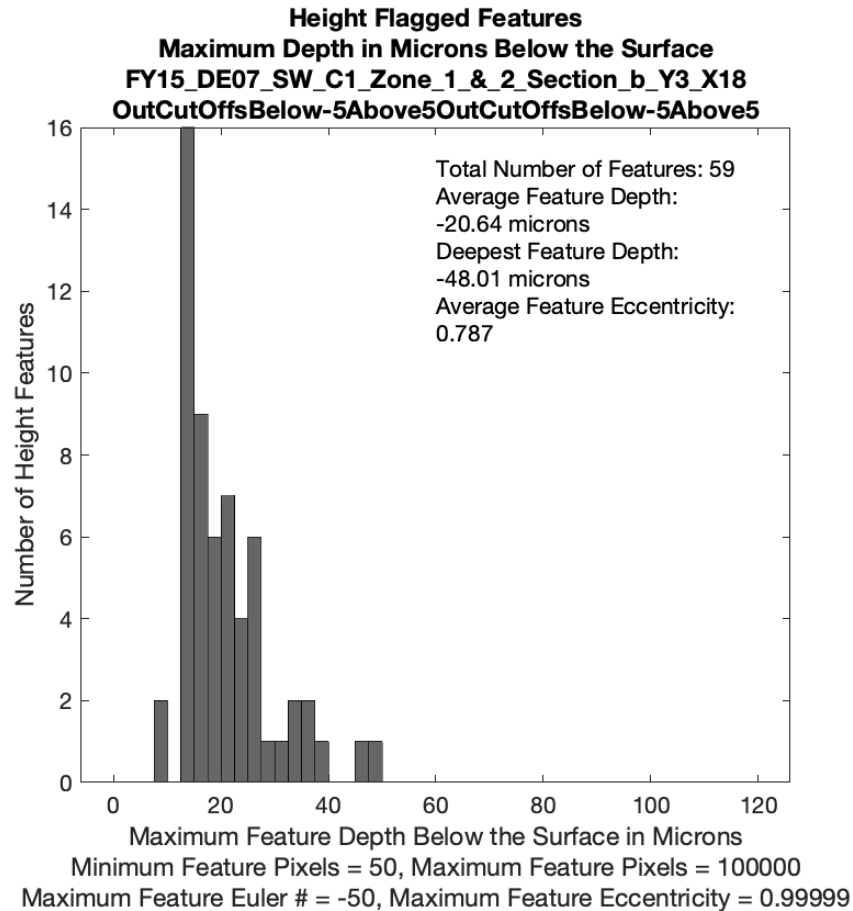
# Pit Depth Y2X7 Histogram Height Data

## Deepest Pit Ranking: 4



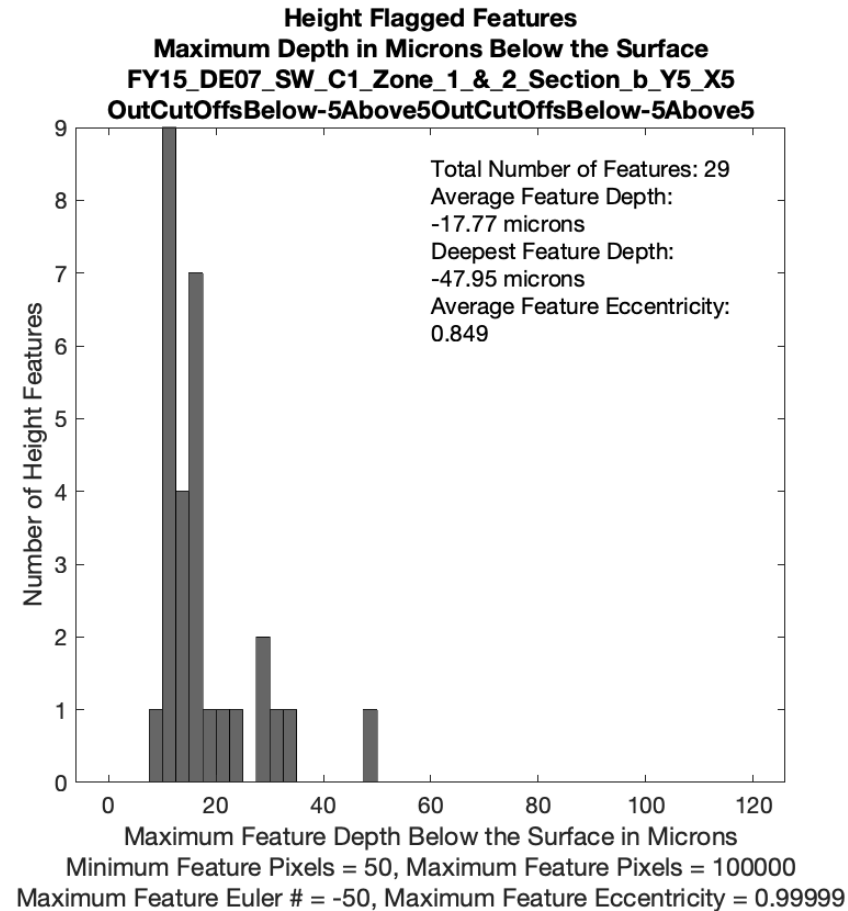
# Pit Depth Y3X18 Histogram Height Data

## Deepest Pit Ranking: 5



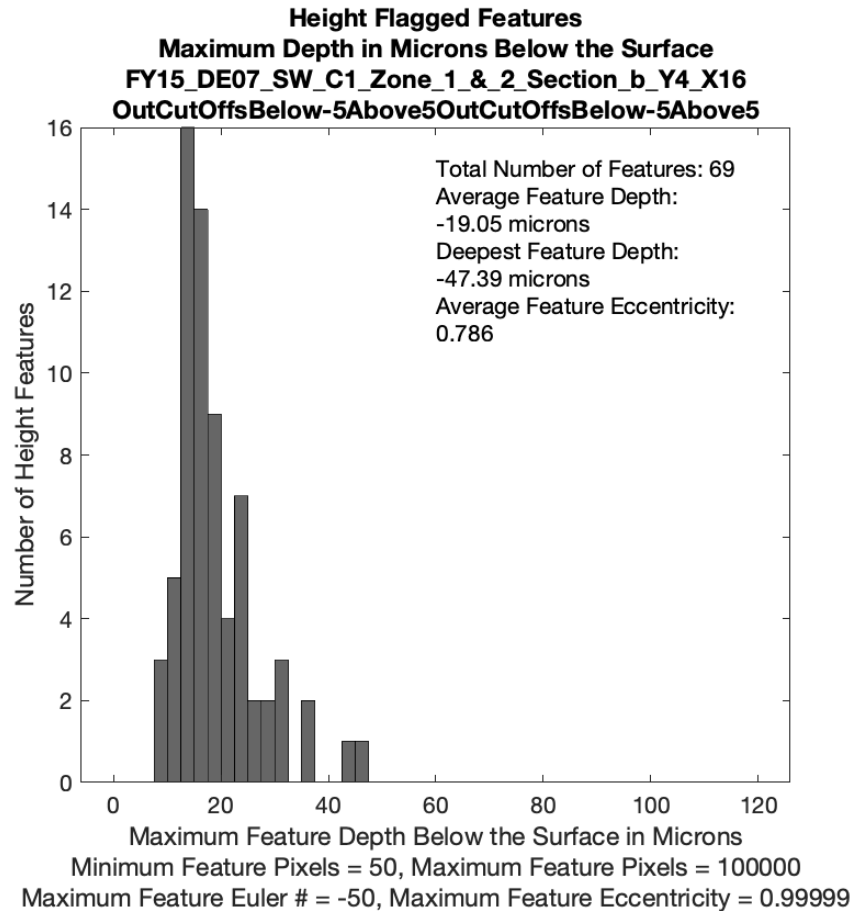
# Pit Depth Y5X5 Histogram Height Data

## Deepest Pit Ranking: 6



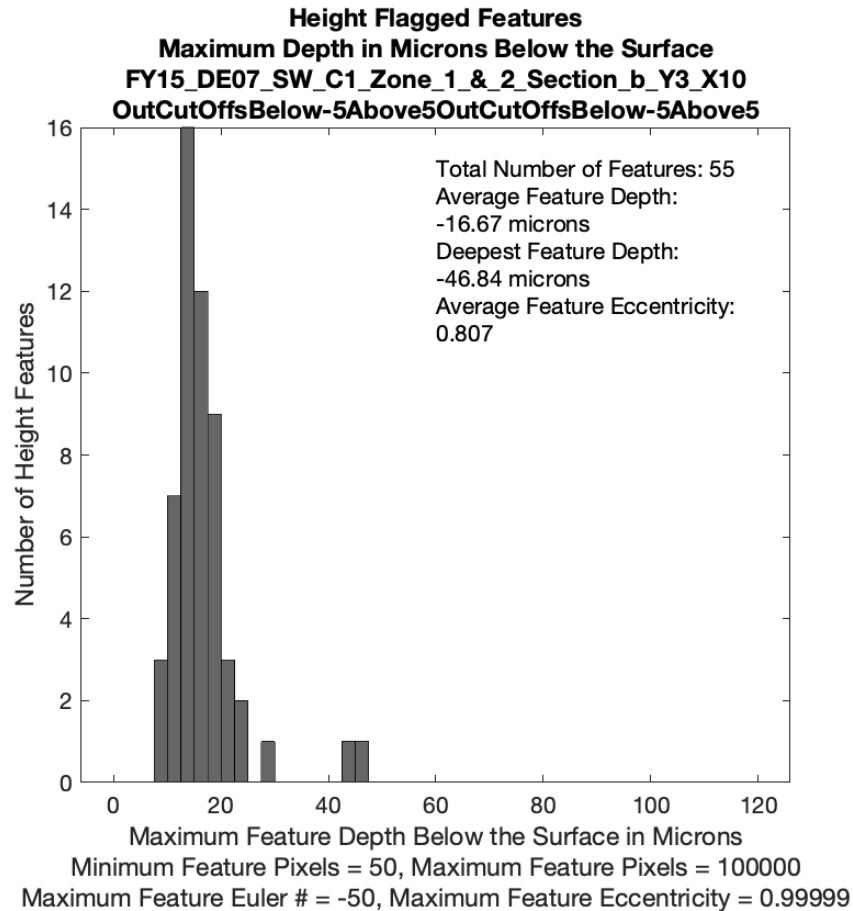
# Pit Depth Y4X16 Histogram Height Data

## Deepest Pit Ranking: 7



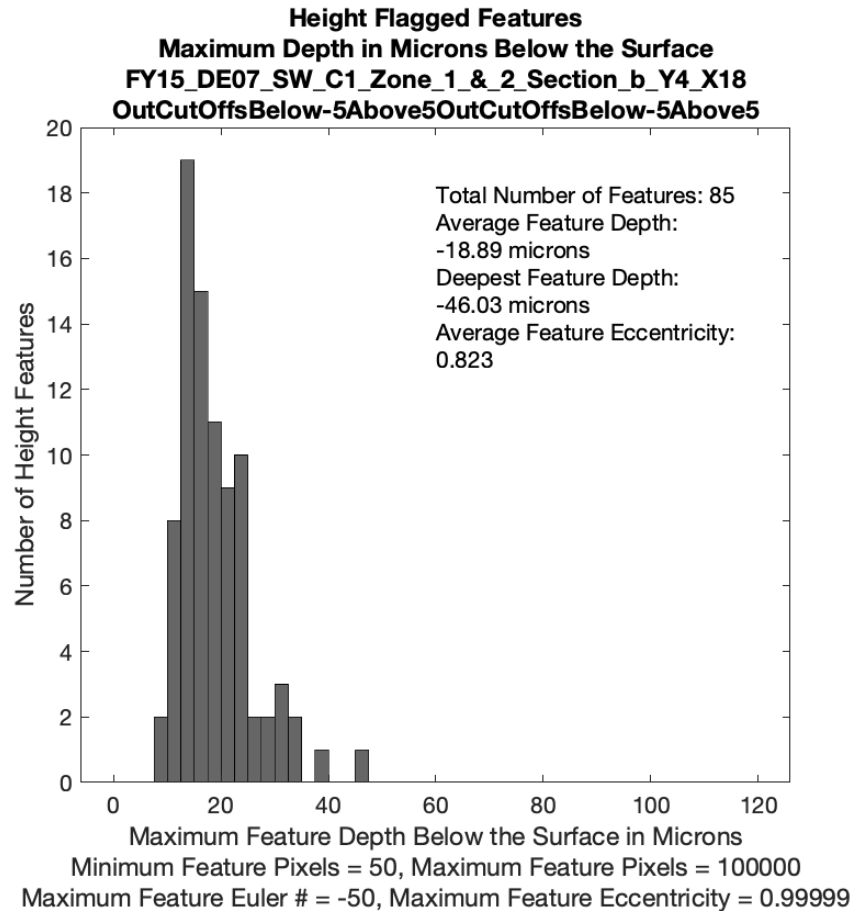
# Pit Depth Y3X10 Histogram Height Data

## Deepest Pit Ranking: 8



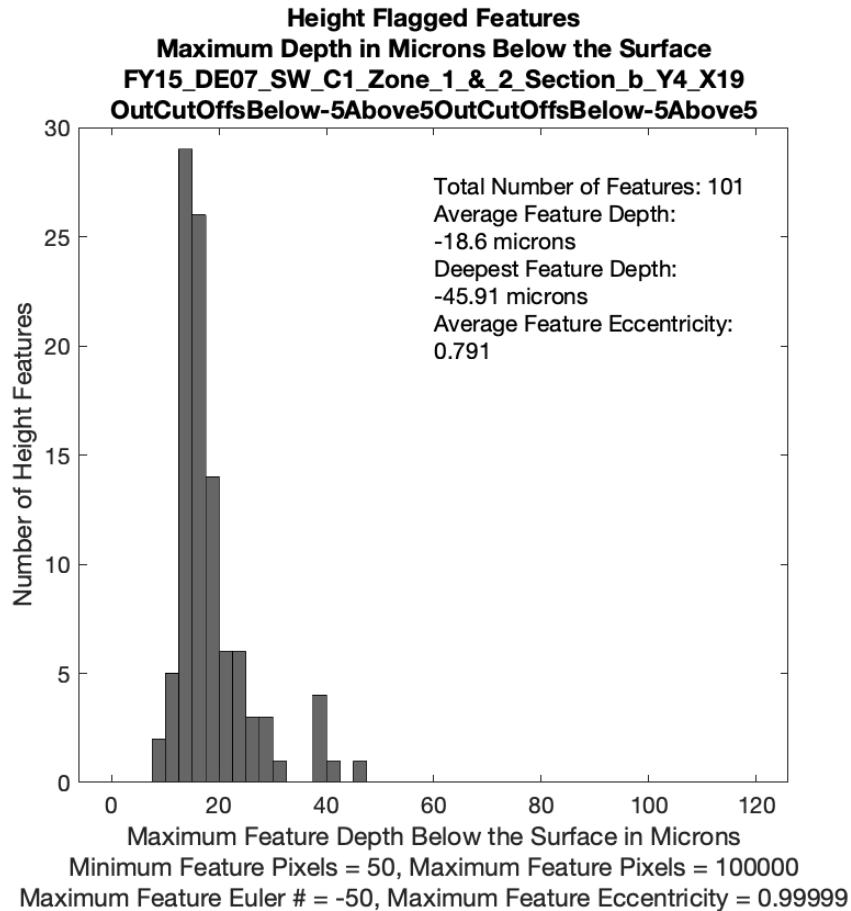
# Pit Depth Y4X18 Histogram Height Data

## Deepest Pit Ranking: 9



# Pit Depth Y4X19 Histogram Height Data

## Deepest Pit Ranking: 10

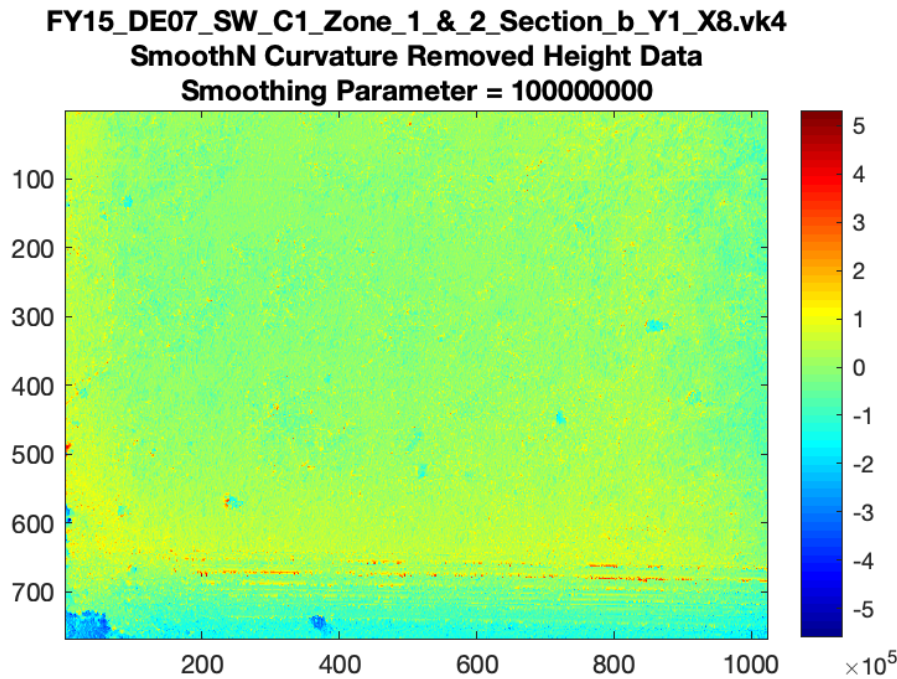




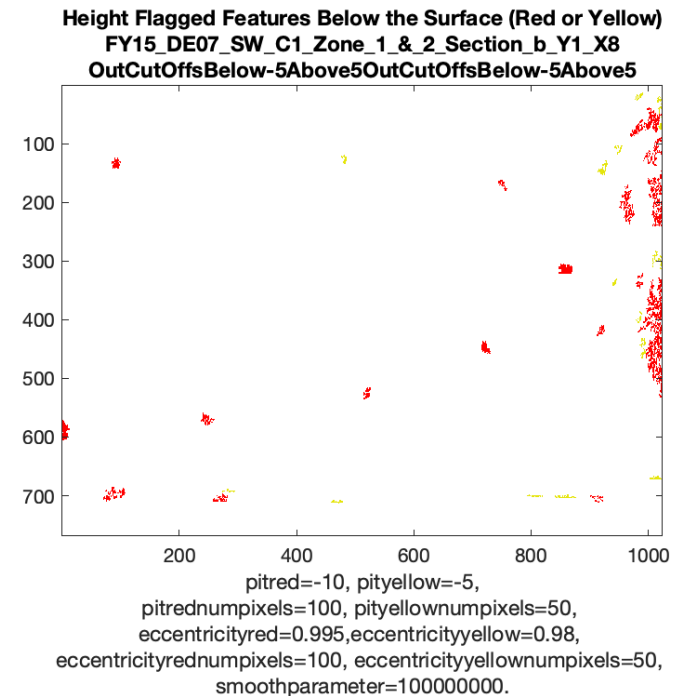
# Pit Depth Y1X8 Histogram Height Data

## Deepest Pit Ranking: 1

### Flattened Height Data



### Flagged Height Features

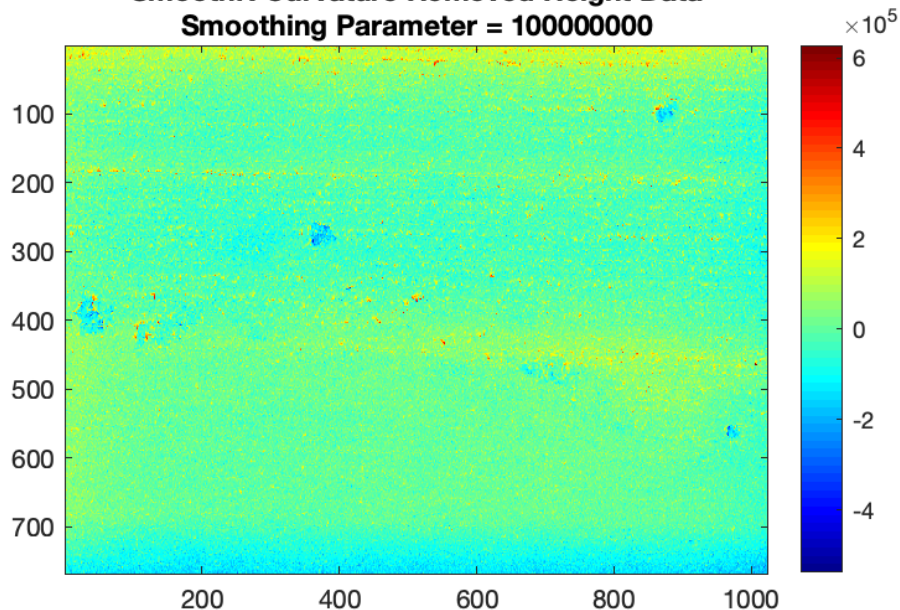


# Pit Depth Y4X11 Histogram Height Data

## Deepest Pit Ranking: 2

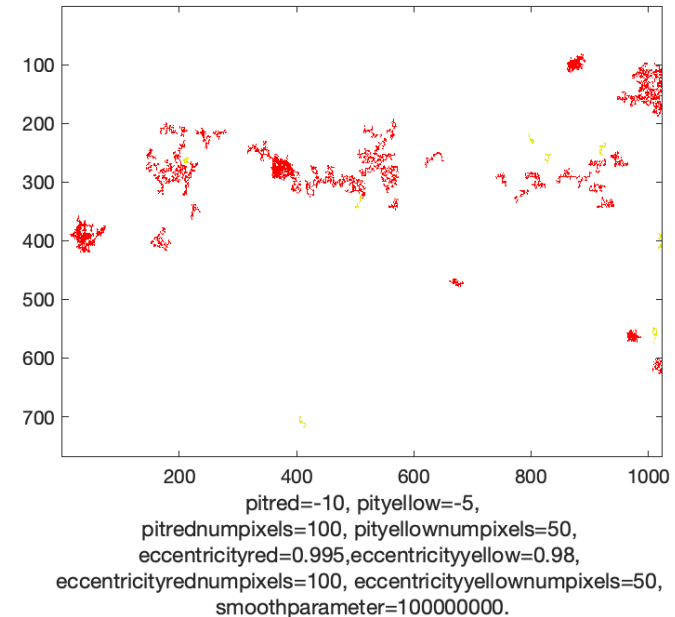
### Flattened Height Data

FY15\_DE07\_SW\_C1\_Zone\_1\_&\_2\_Section\_b\_Y4\_X11.vk4  
SmoothN Curvature Removed Height Data  
Smoothing Parameter = 100000000



### Flagged Height Features

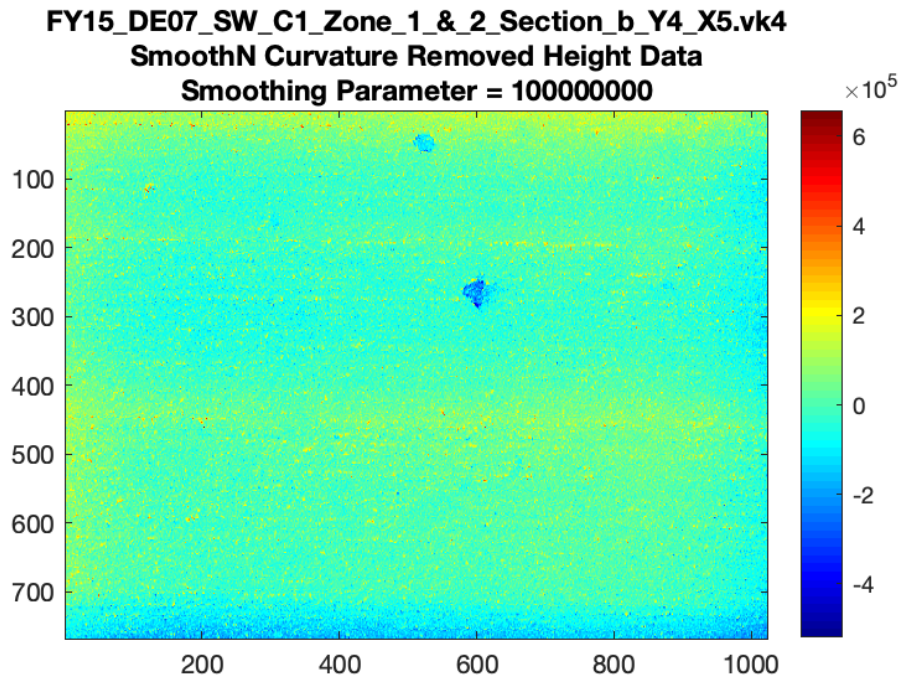
Height Flagged Features Below the Surface (Red or Yellow)  
FY15\_DE07\_SW\_C1\_Zone\_1\_&\_2\_Section\_b\_Y4\_X11  
OutCutOffsBelow-5Above5OutCutOffsBelow-5Above5



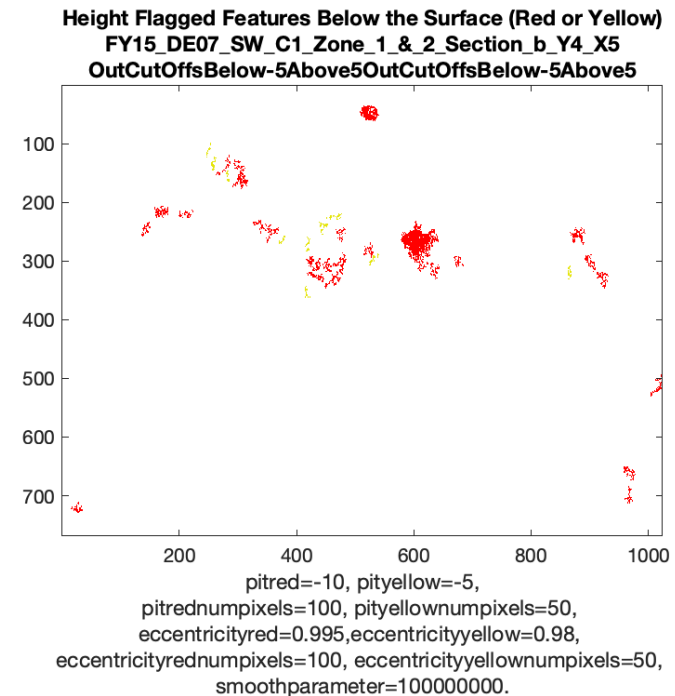
# Pit Depth Y4X5 Histogram Height Data

## Deepest Pit Ranking: 3

### Flattened Height Data



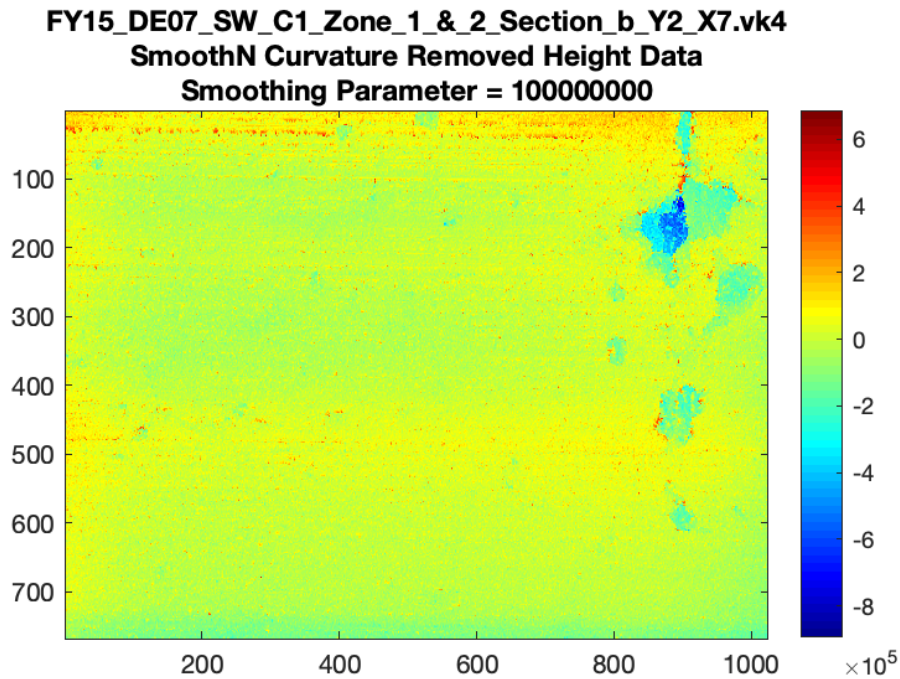
### Flagged Height Features



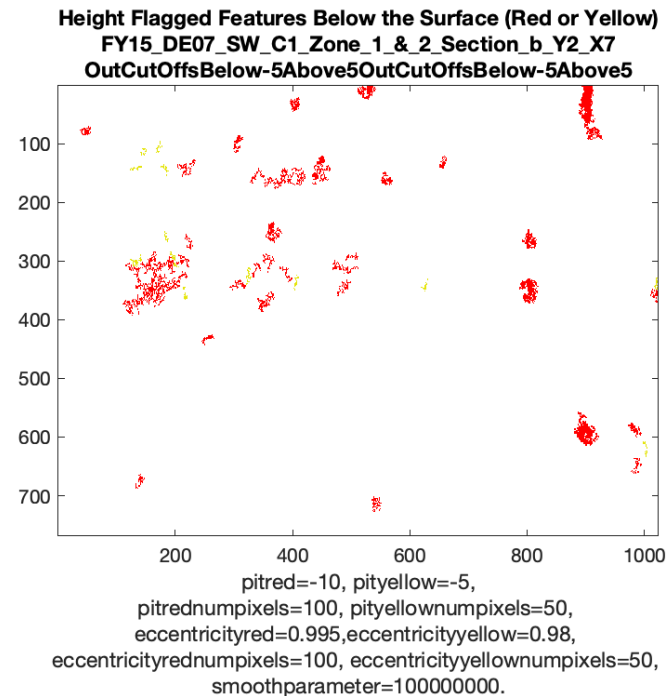
# Pit Depth Y2X7 Histogram Height Data

## Deepest Pit Ranking: 4

### Flattened Height Data



### Flagged Height Features



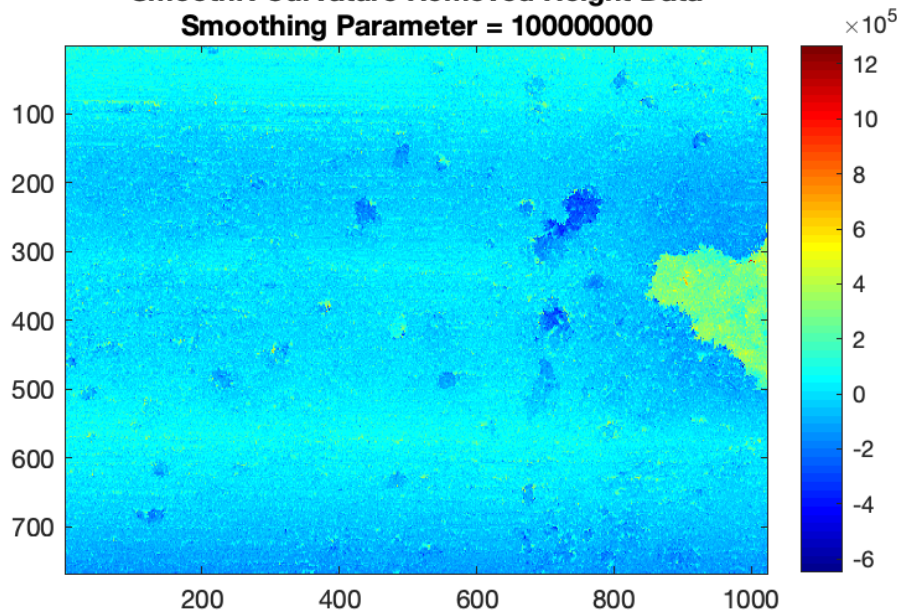


# Pit Depth Y3X18 Histogram Height Data

## Deepest Pit Ranking: 5

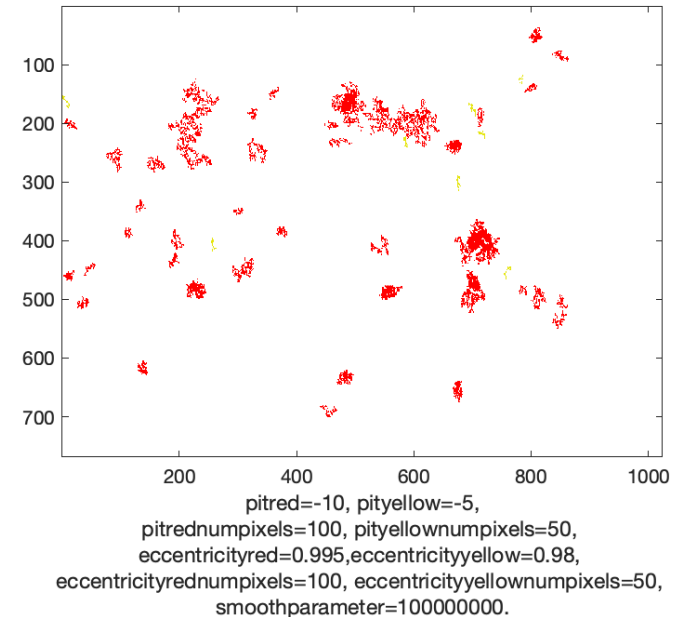
### Flattened Height Data

FY15\_DE07\_SW\_C1\_Zone\_1\_&\_2\_Section\_b\_Y3\_X18.vk4  
SmoothN Curvature Removed Height Data  
Smoothing Parameter = 100000000



### Flagged Height Features

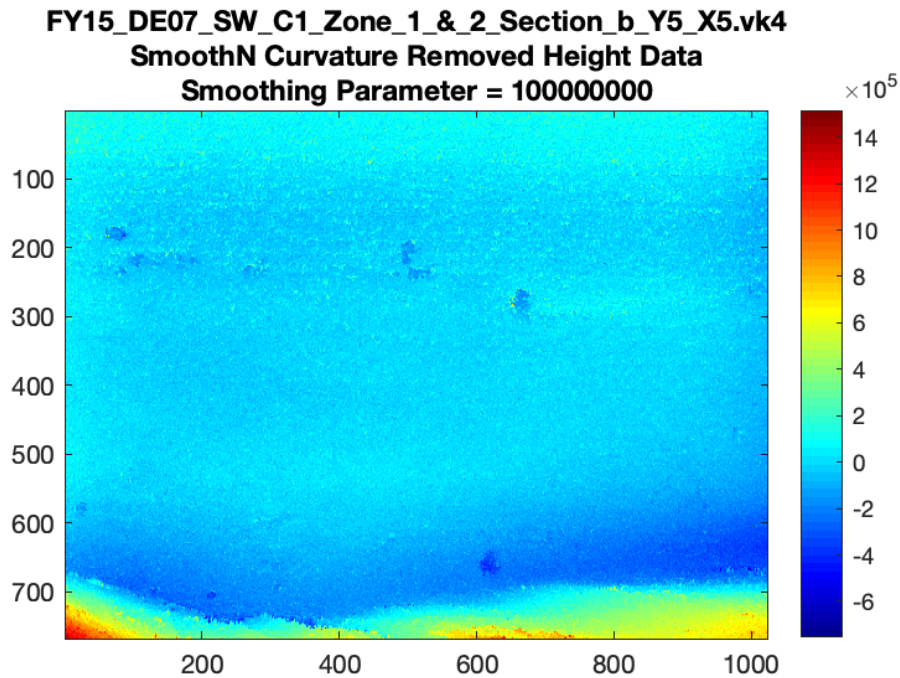
Height Flagged Features Below the Surface (Red or Yellow)  
FY15\_DE07\_SW\_C1\_Zone\_1\_&\_2\_Section\_b\_Y3\_X18  
OutCutOffsBelow-5Above5OutCutOffsBelow-5Above5



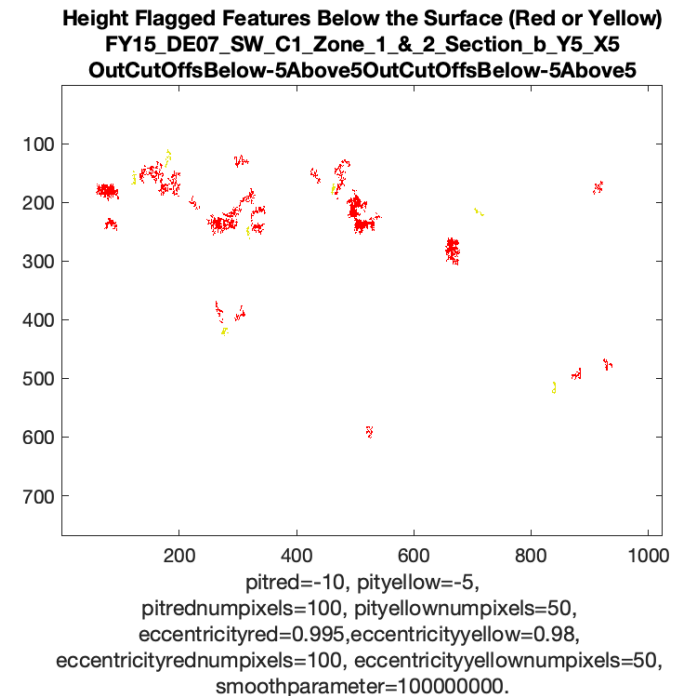
# Pit Depth Y5X5 Histogram Height Data

## Deepest Pit Ranking: 6

### Flattened Height Data



### Flagged Height Features

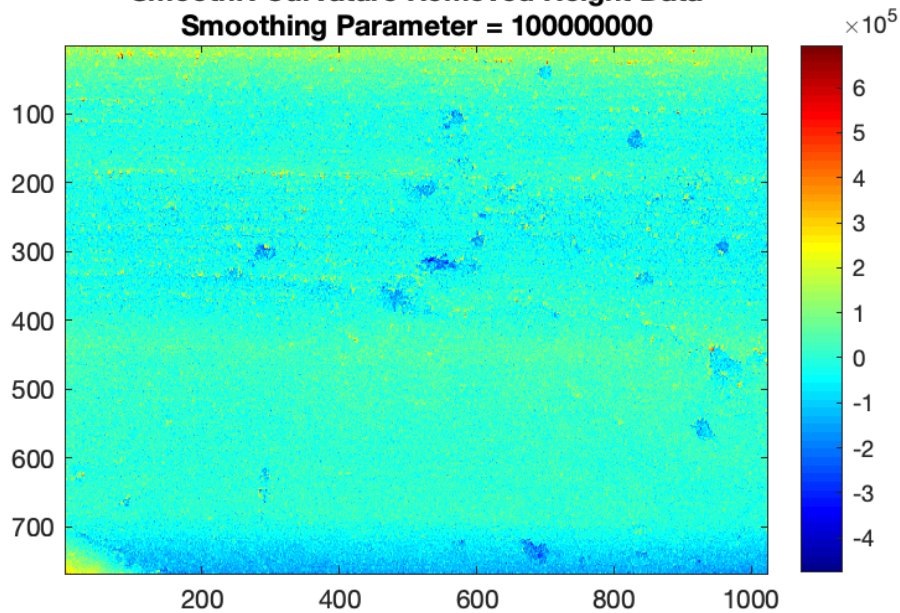


# Pit Depth Y4X16 Histogram Height Data

## Deepest Pit Ranking: 7

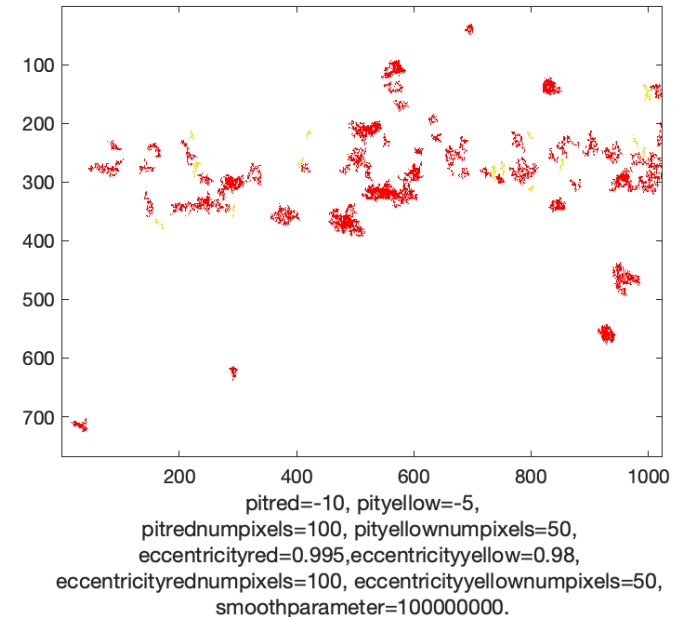
### Flattened Height Data

FY15\_DE07\_SW\_C1\_Zone\_1\_&\_2\_Section\_b\_Y4\_X16.vk4  
SmoothN Curvature Removed Height Data  
Smoothing Parameter = 100000000



### Flagged Height Features

Height Flagged Features Below the Surface (Red or Yellow)  
FY15\_DE07\_SW\_C1\_Zone\_1\_&\_2\_Section\_b\_Y4\_X16  
OutCutOffsBelow-5Above5OutCutOffsBelow-5Above5

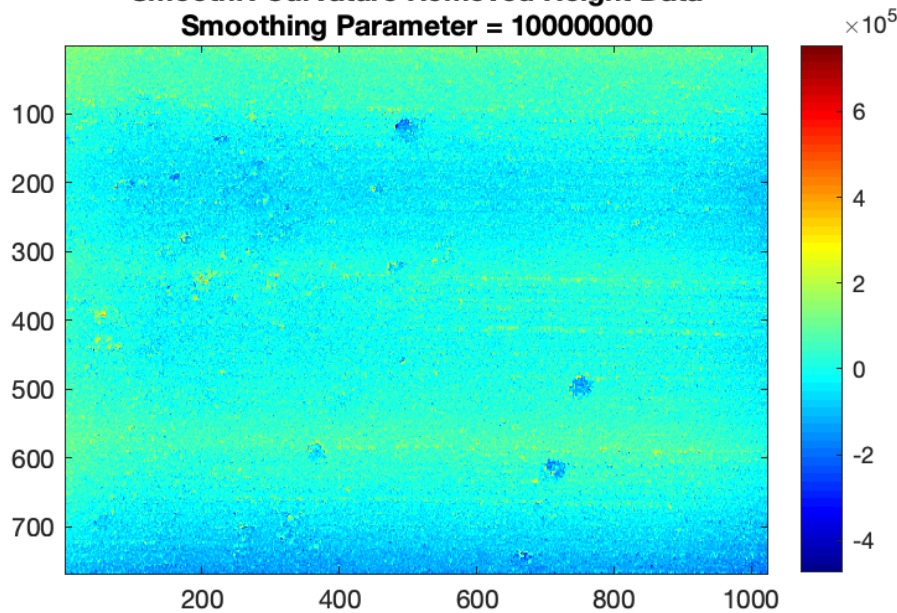


# Pit Depth Y3X10 Histogram Height Data

## Deepest Pit Ranking: 8

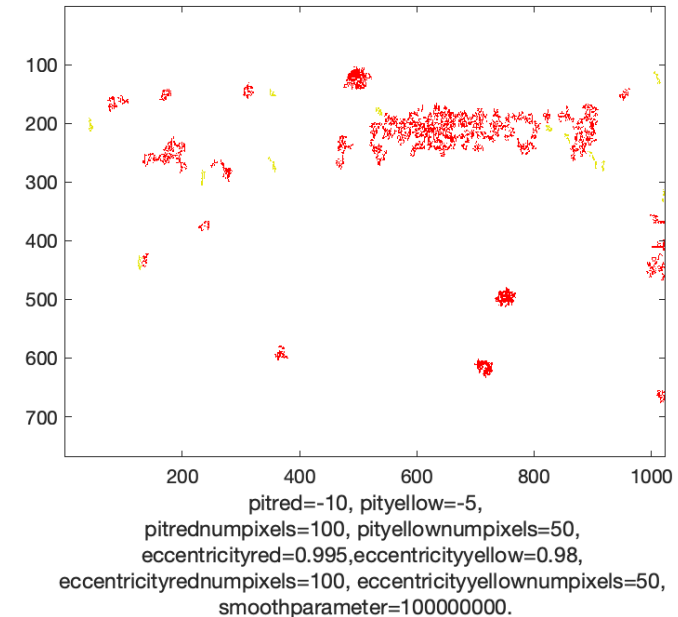
### Flattened Height Data

FY15\_DE07\_SW\_C1\_Zone\_1\_&\_2\_Section\_b\_Y3\_X10.vk4  
SmoothN Curvature Removed Height Data  
Smoothing Parameter = 10000000



### Flagged Height Features

Height Flagged Features Below the Surface (Red or Yellow)  
FY15\_DE07\_SW\_C1\_Zone\_1\_&\_2\_Section\_b\_Y3\_X10  
OutCutOffsBelow-5Above5OutCutOffsBelow-5Above5



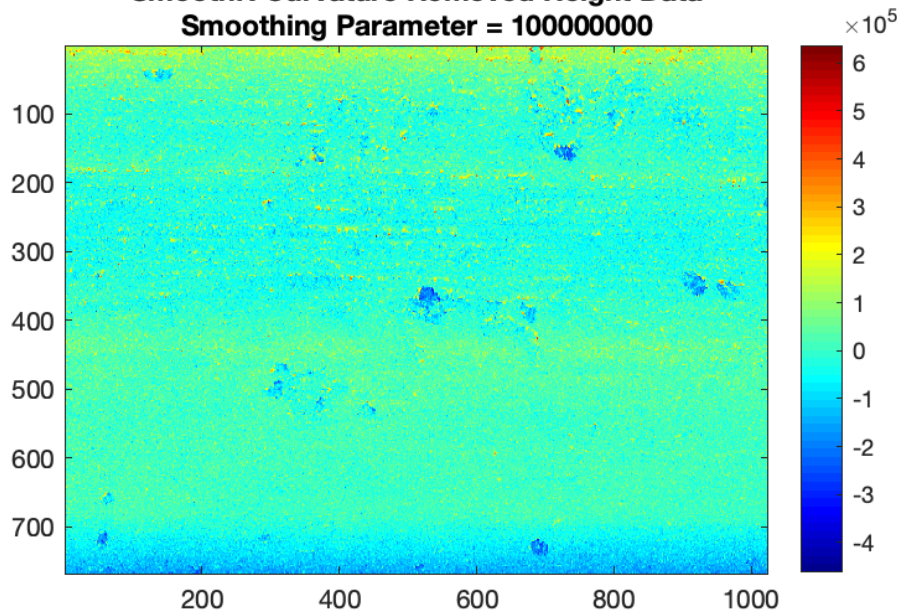


# Pit Depth Y4X18 Histogram Height Data

## Deepest Pit Ranking: 9

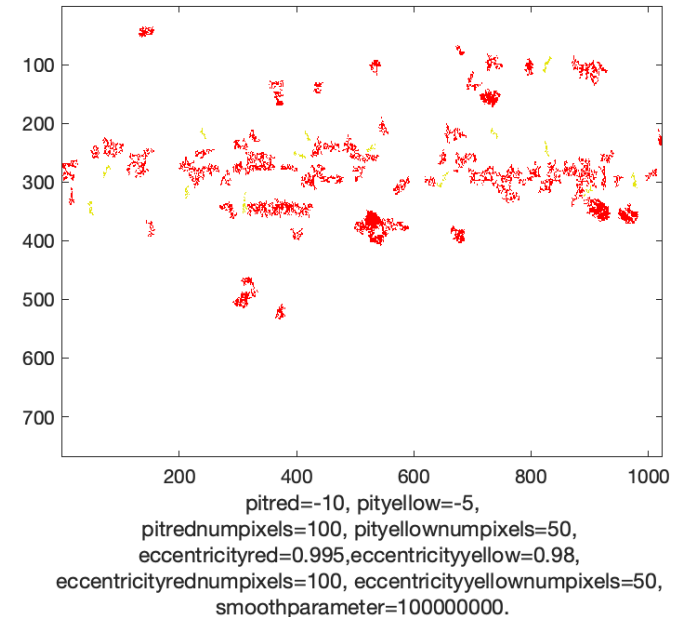
### Flattened Height Data

FY15\_DE07\_SW\_C1\_Zone\_1\_&\_2\_Section\_b\_Y4\_X18.vk4  
SmoothN Curvature Removed Height Data  
Smoothing Parameter = 10000000



### Flagged Height Features

Height Flagged Features Below the Surface (Red or Yellow)  
FY15\_DE07\_SW\_C1\_Zone\_1\_&\_2\_Section\_b\_Y4\_X18  
OutCutOffsBelow-5Above5OutCutOffsBelow-5Above5

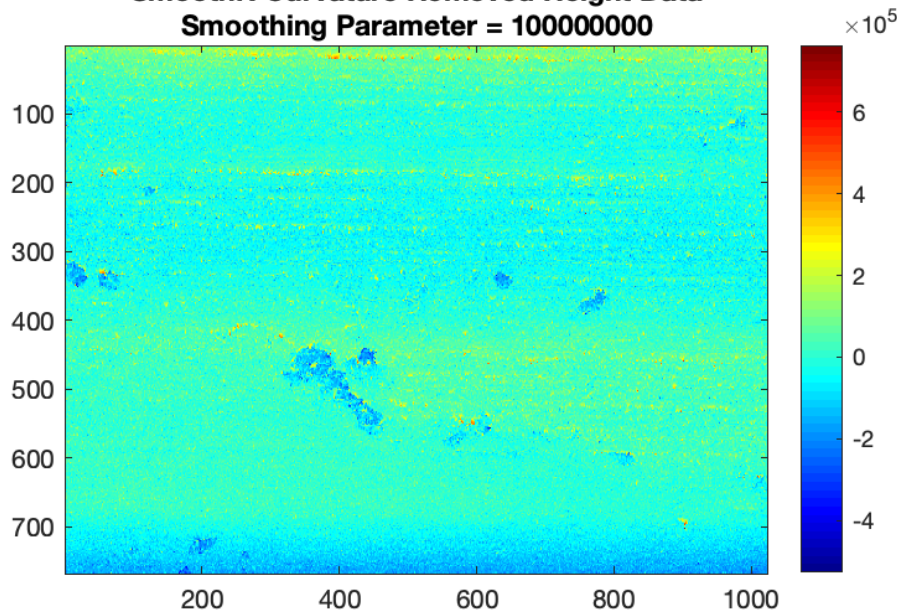


# Pit Depth Y4X19 Histogram Height Data

## Deepest Pit Ranking: 10

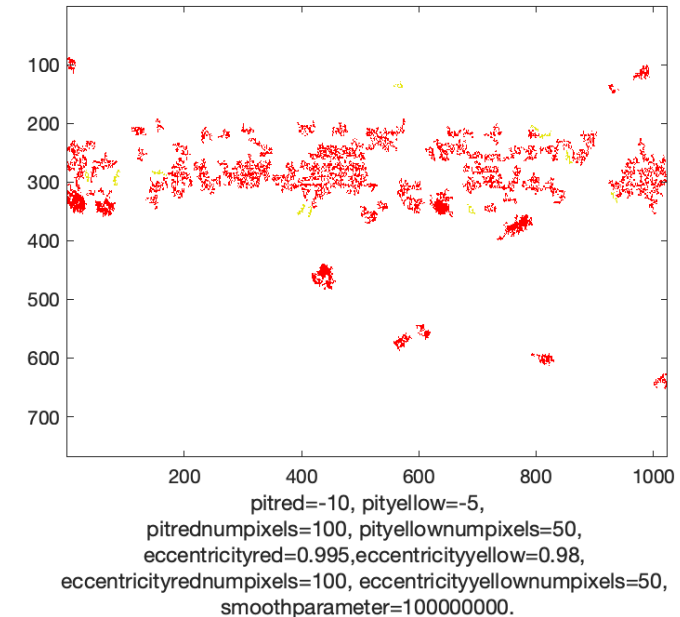
### Flattened Height Data

FY15\_DE07\_SW\_C1\_Zone\_1\_&\_2\_Section\_b\_Y4\_X19.vk4  
SmoothN Curvature Removed Height Data  
Smoothing Parameter = 100000000

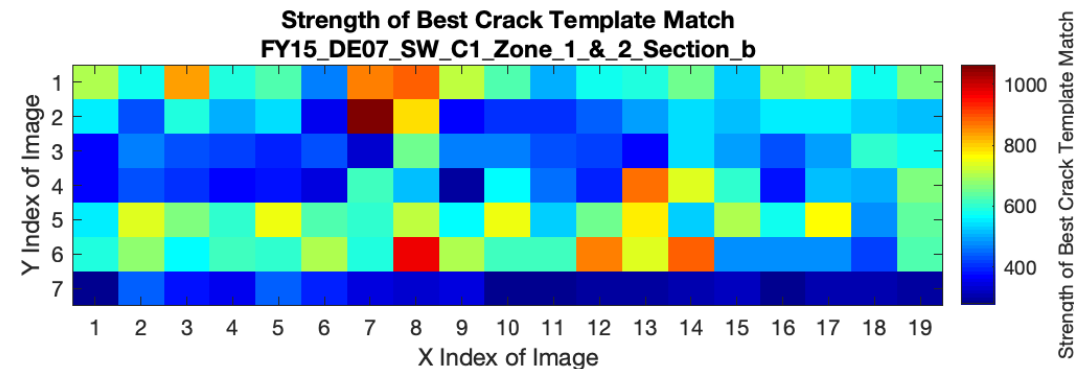


### Flagged Height Features

Height Flagged Features Below the Surface (Red or Yellow)  
FY15\_DE07\_SW\_C1\_Zone\_1\_&\_2\_Section\_b\_Y4\_X19  
OutCutOffsBelow-5Above5OutCutOffsBelow-5Above5



# Crack Strength YX Index Key All Images: FY15\_DE07\_SW\_C1\_Zone\_1\_&\_2\_Section\_b Intensity Data

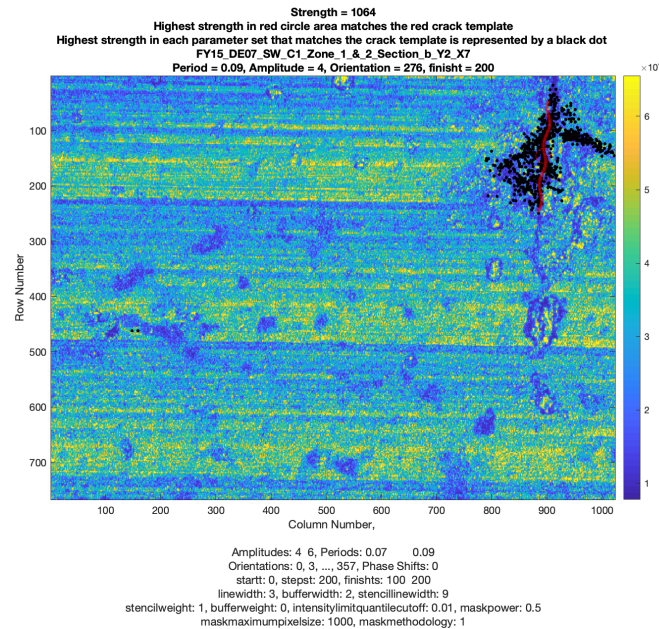


Amplitudes: 4 6, Periods: 0.07 0.09  
Orientations: 0, 3, ..., 357, Phase Shifts: 0  
startt: 0, stepst: 200, finishts: 100 200  
linewidth: 3, bufferwidth: 2, stencillinewidth: 9  
stencilweight: 1, bufferweight: 0  
intensitylimitquantilecutoff: 0.01, maskpower: 0.5  
maskmaximumpixelsize: 1000, maskmethodology: 1

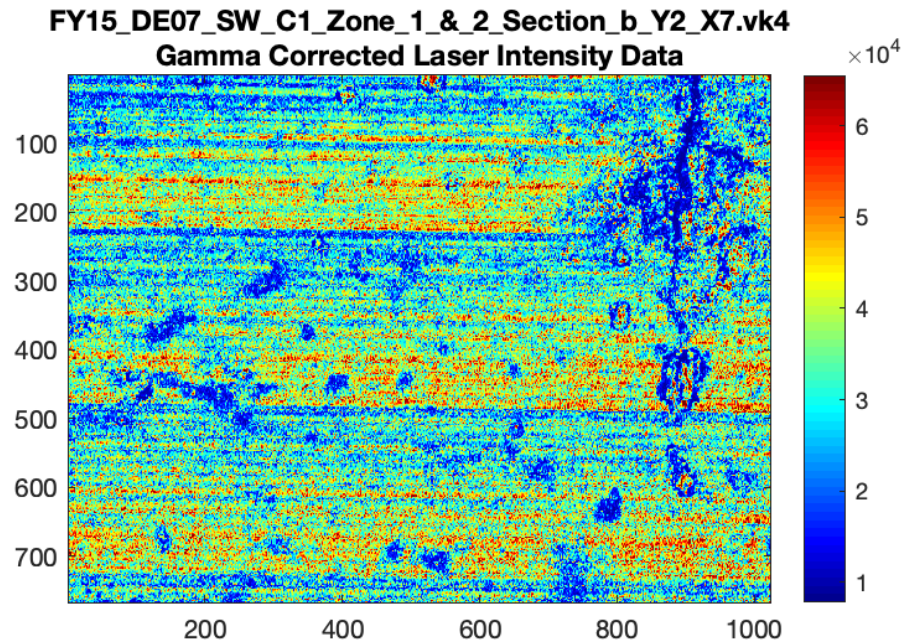


# Crack Strength of Image Y2X7, Intensity Data Strongest All Image Ranking: 1, Strength: 1064

Crack Template Matches (black dots)

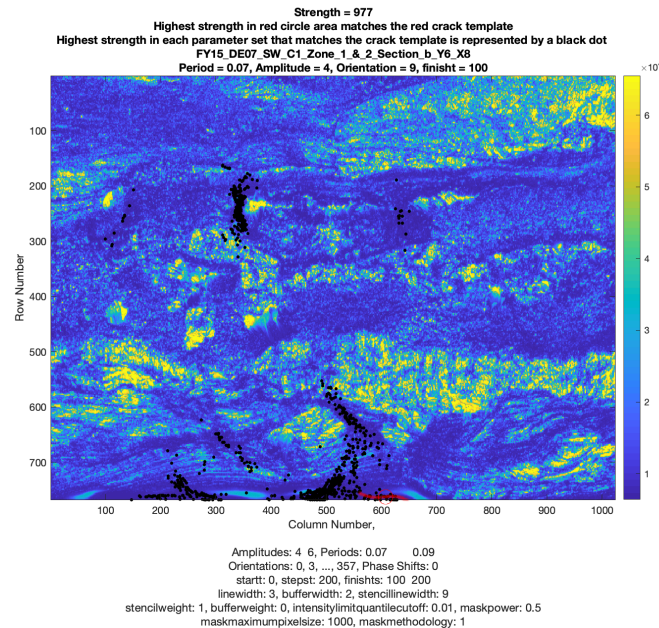


Original Intensity Data (different scale)

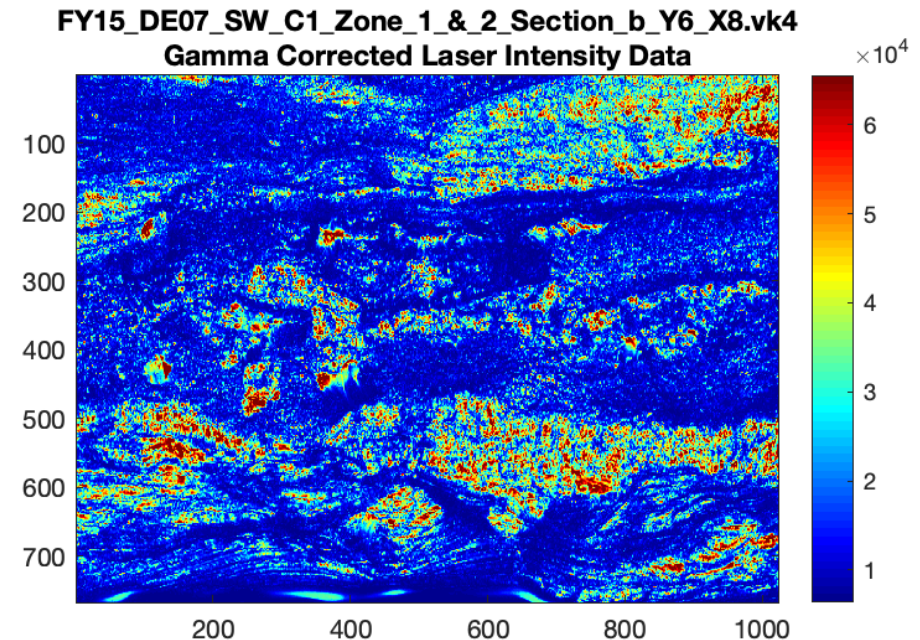


# Crack Strength of Image Y6X8, Intensity Data Strongest All Image Ranking: 2, Strength: 977

**Crack Template Matches (black dots)**



**Original Intensity Data (different scale)**

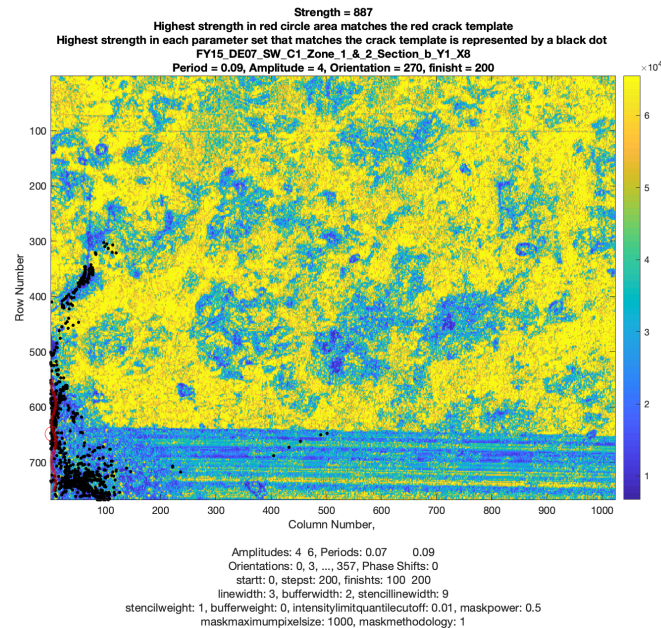




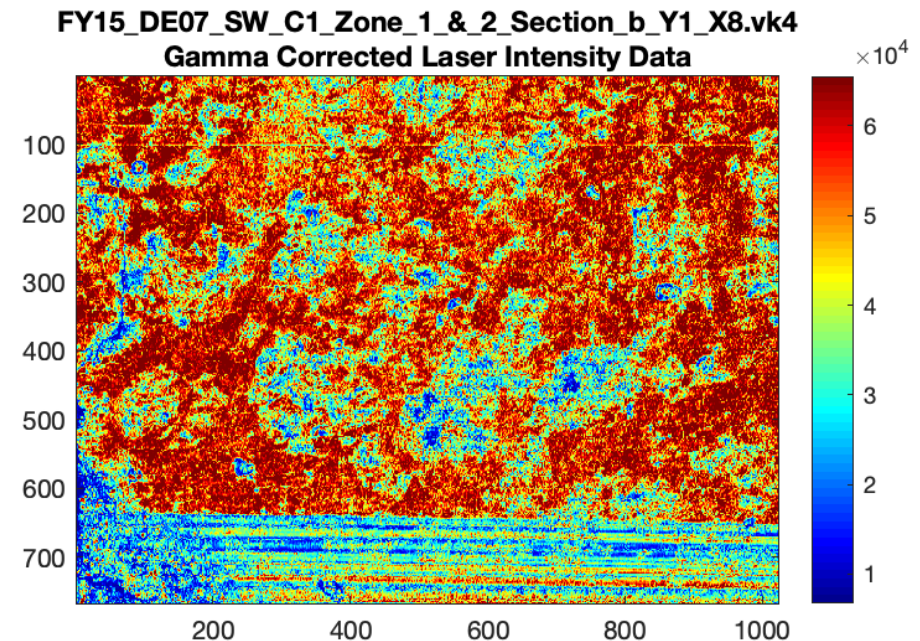
# Crack Strength of Image Y1X8, Intensity Data

## Strongest All Image Ranking: 3, Strength: 887

**Crack Template Matches (black dots)**

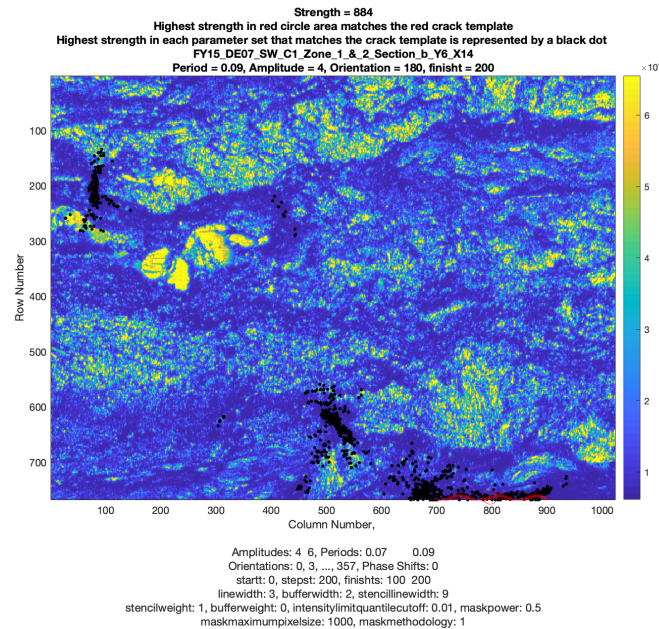


**Original Intensity Data (different scale)**

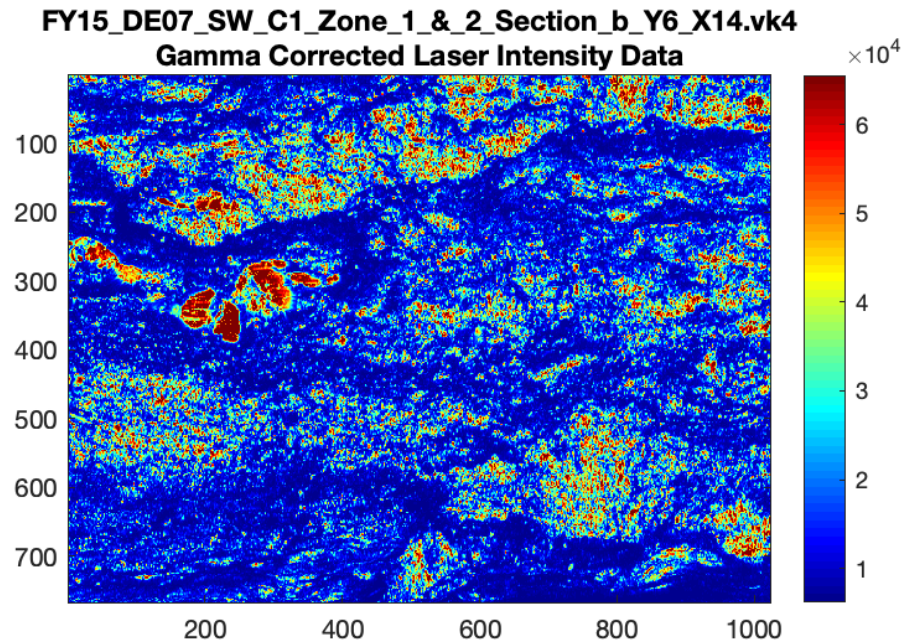


# Crack Strength of Image Y6X14, Intensity Data Strongest All Image Ranking: 4, Strength: 884

**Crack Template Matches (black dots)**



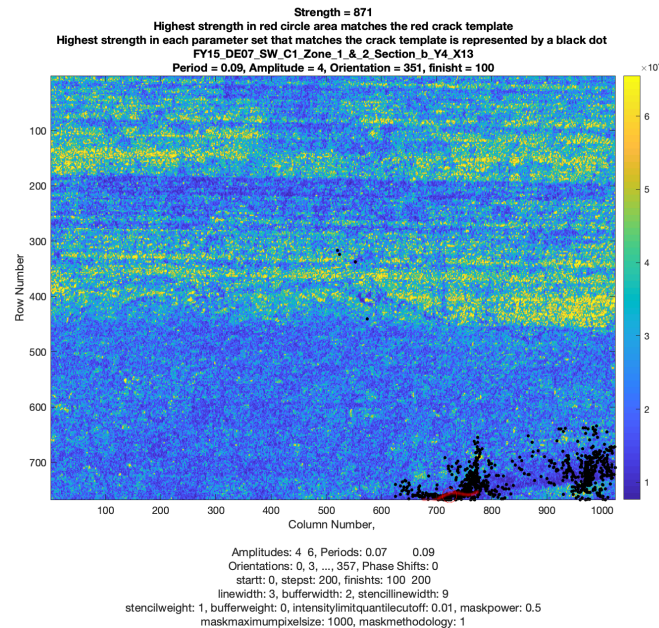
**Original Intensity Data (different scale)**



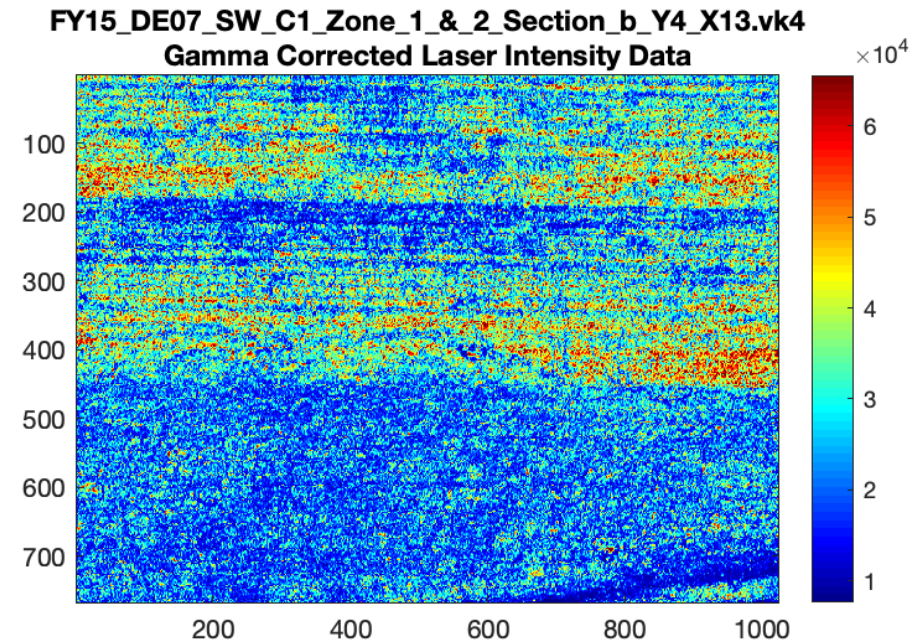


# Crack Strength of Image Y4X13, Intensity Data Strongest All Image Ranking: 5, Strength: 871

**Crack Template Matches (black dots)**



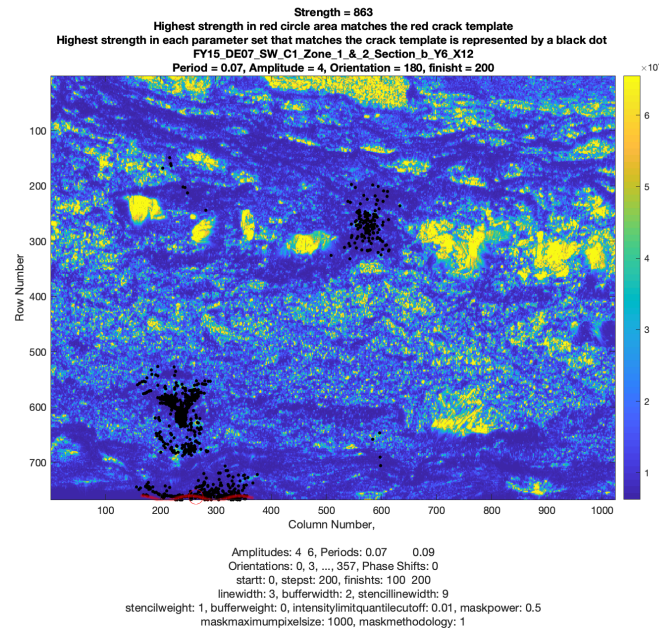
**Original Intensity Data (different scale)**



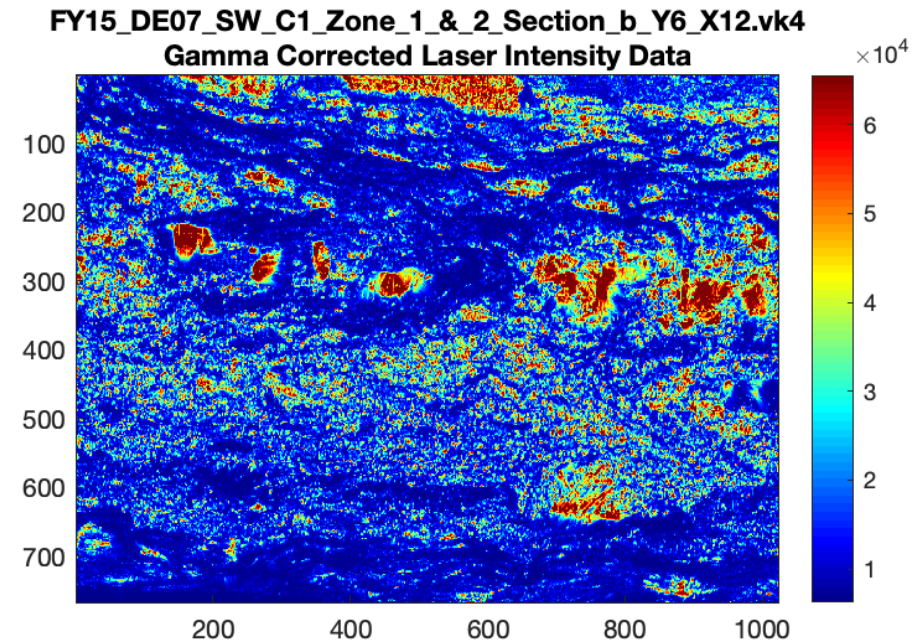


# Crack Strength of Image Y6X12, Intensity Data Strongest All Image Ranking: 6, Strength: 863

## Crack Template Matches (black dots)

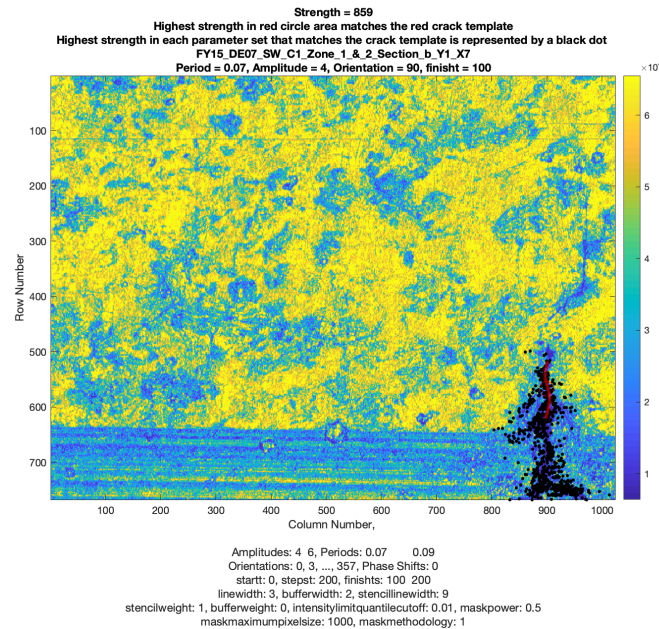


## Original Intensity Data (different scale)

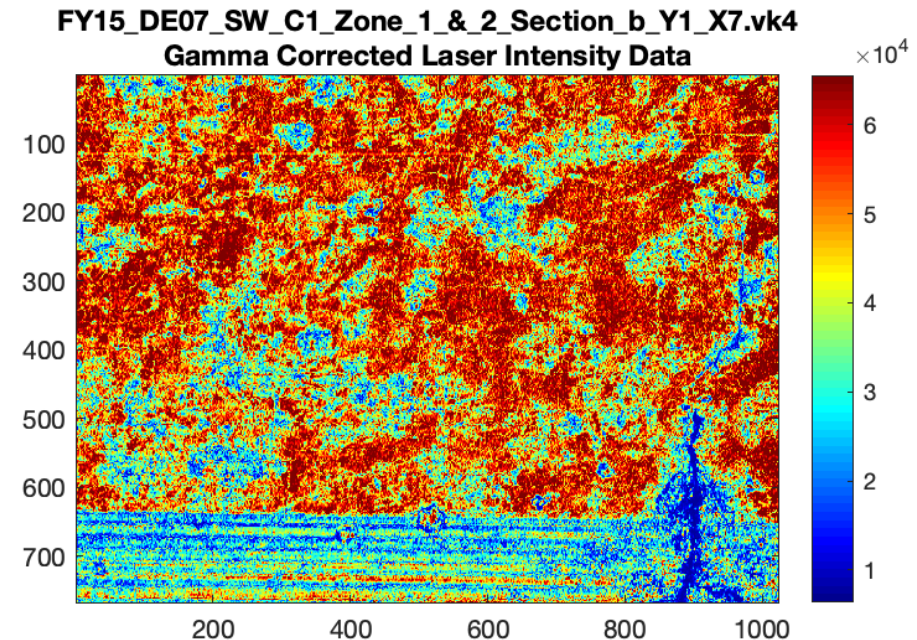


# Crack Strength of Image Y1X7, Intensity Data Strongest All Image Ranking: 7, Strength: 859

**Crack Template Matches (black dots)**



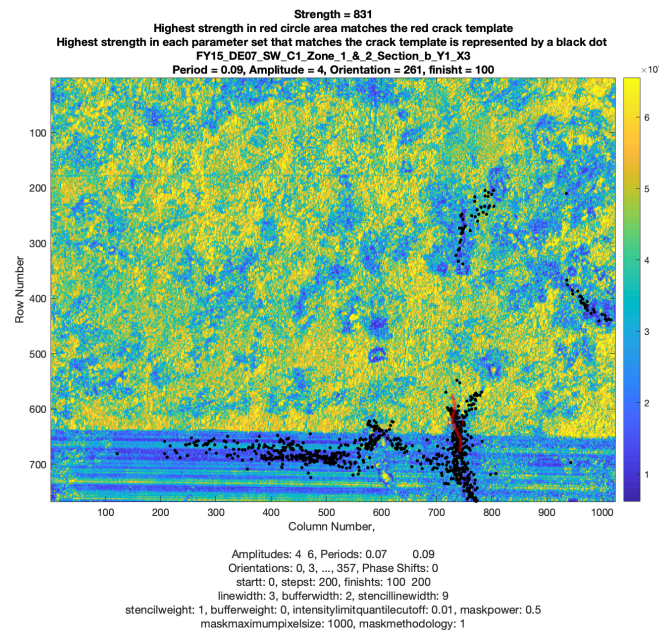
**Original Intensity Data (different scale)**



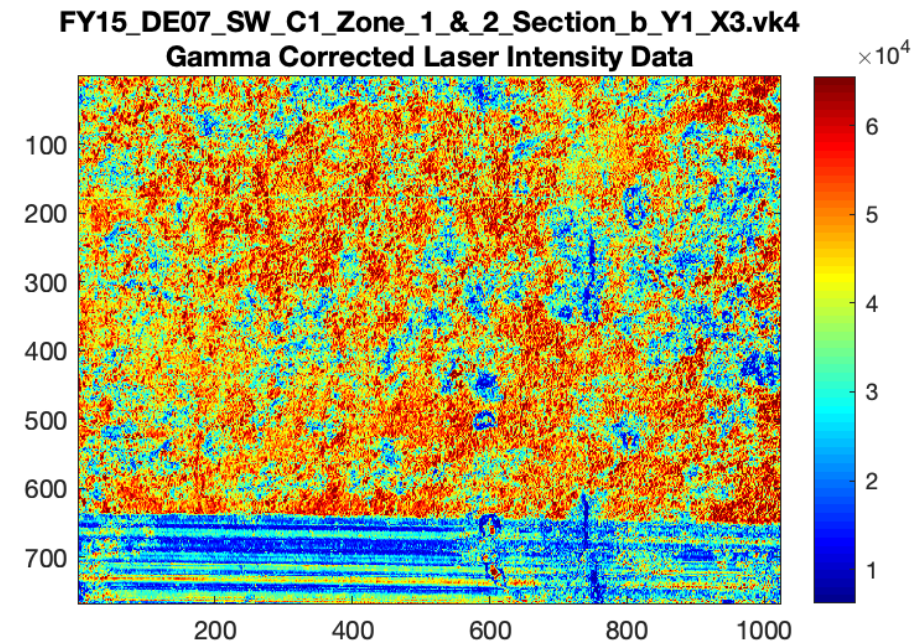


# Crack Strength of Image Y1X3, Intensity Data Strongest All Image Ranking: 8, Strength: 831

**Crack Template Matches (black dots)**

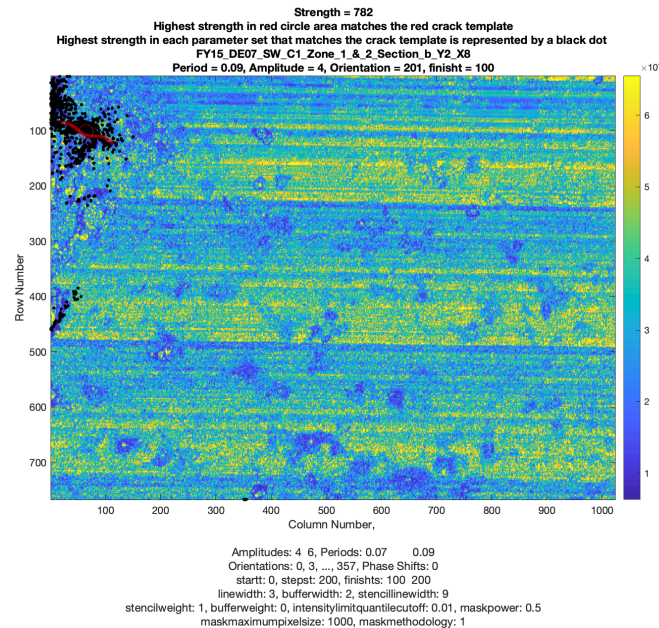


**Original Intensity Data (different scale)**

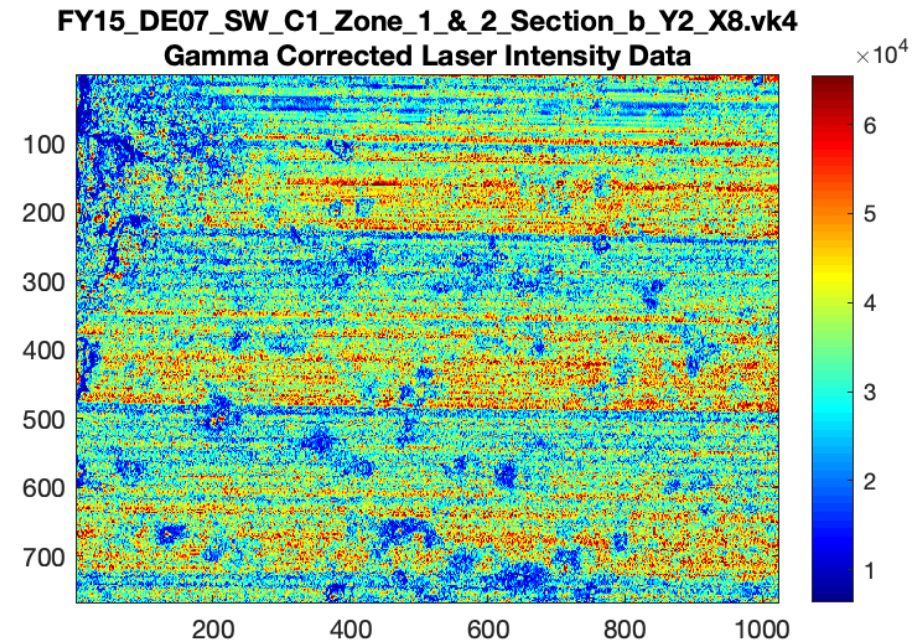


# Crack Strength of Image Y2X8, Intensity Data Strongest All Image Ranking: 9, Strength: 782

**Crack Template Matches (black dots)**



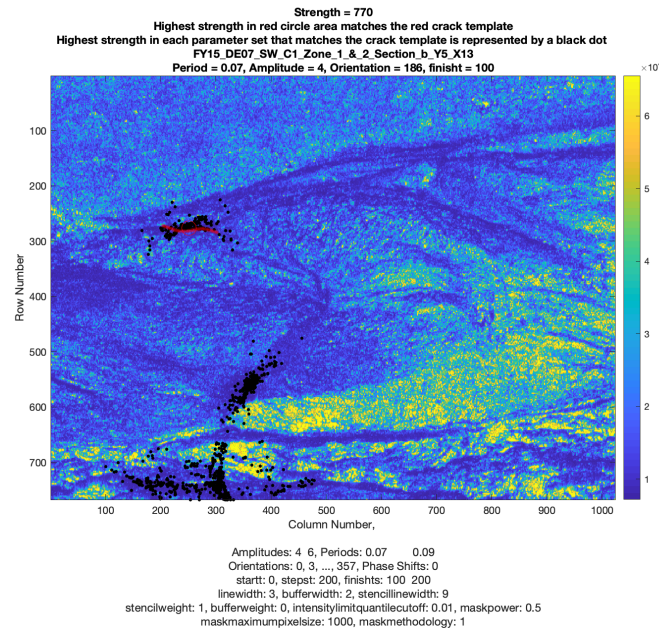
**Original Intensity Data (different scale)**



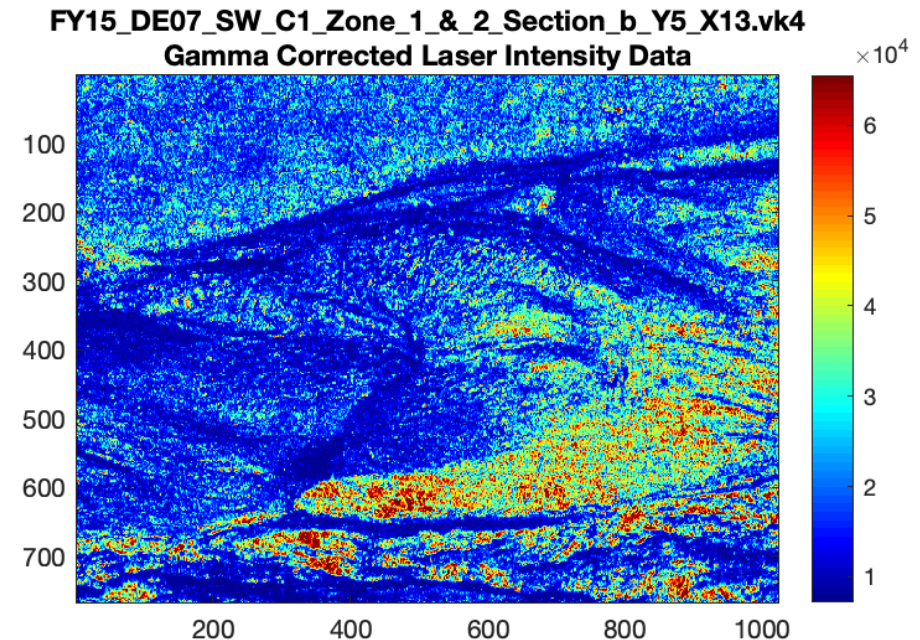


# Crack Strength of Image Y5X13, Intensity Data Strongest All Image Ranking: 10, Strength: 770

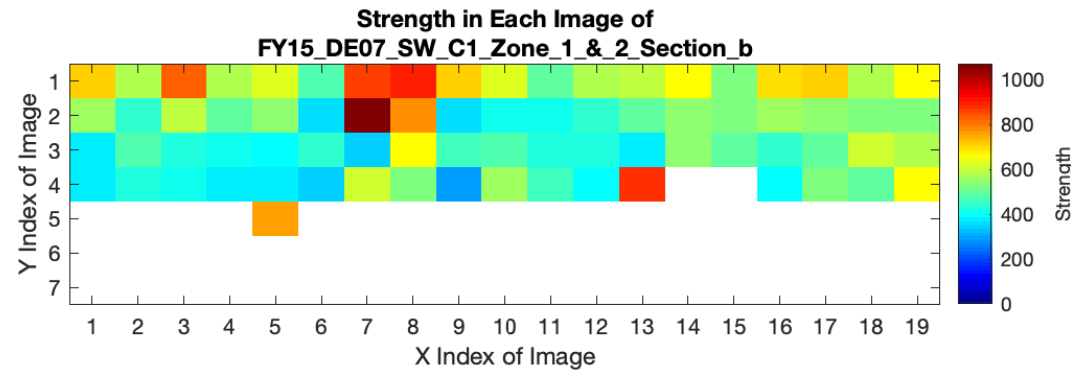
Crack Template Matches (black dots)



Original Intensity Data (different scale)



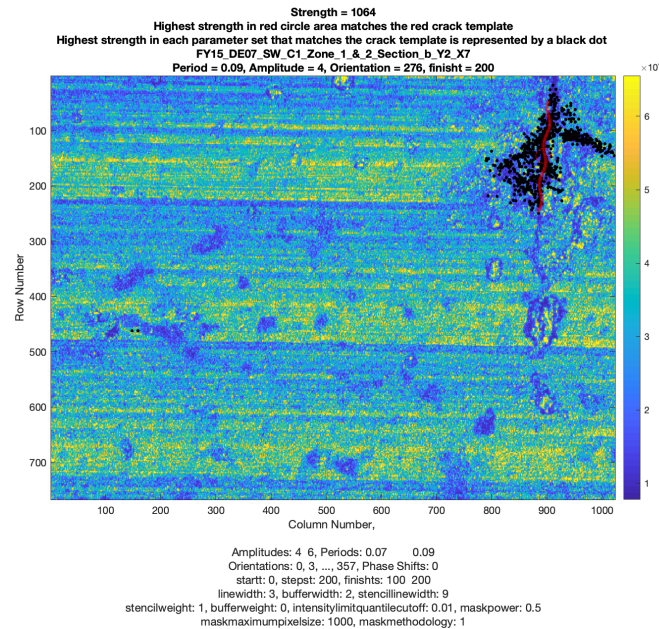
# Crack Strength YX Index Key Select Images: FY15\_DE07\_SW\_C1\_Zone\_1\_&\_2\_Section\_b Intensity Data



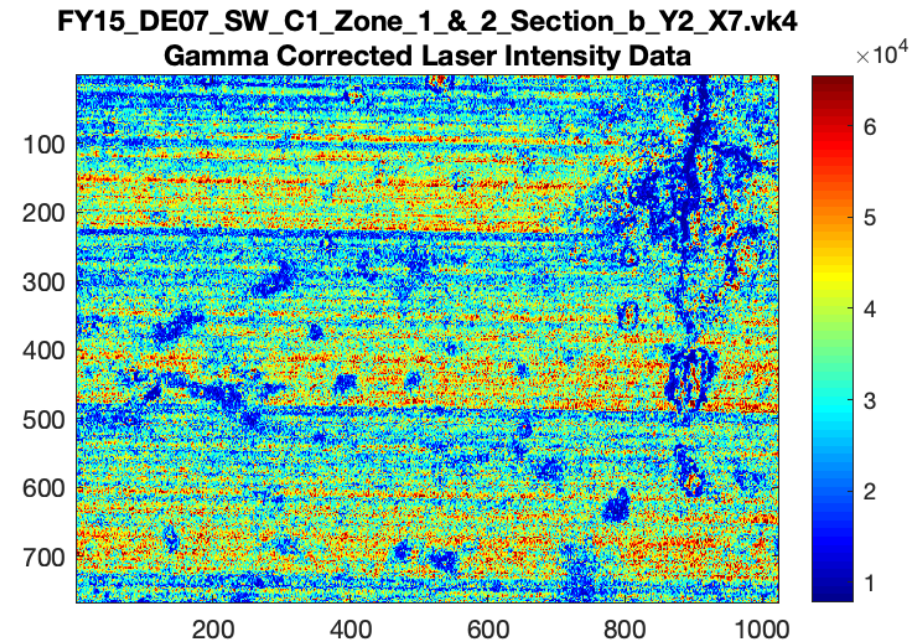


# Crack Strength of Image Y2X7, Intensity Data Strongest Select Image Ranking: 1, Strength: 1064

**Crack Template Matches (black dots)**

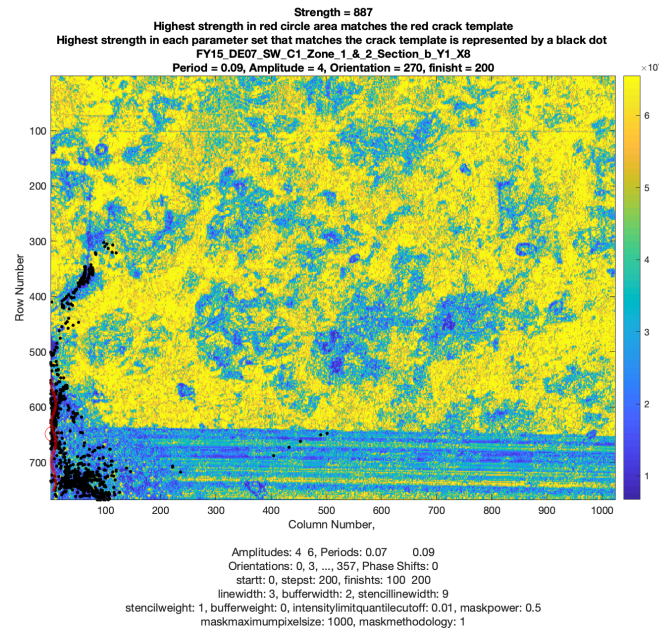


**Original Intensity Data (different scale)**

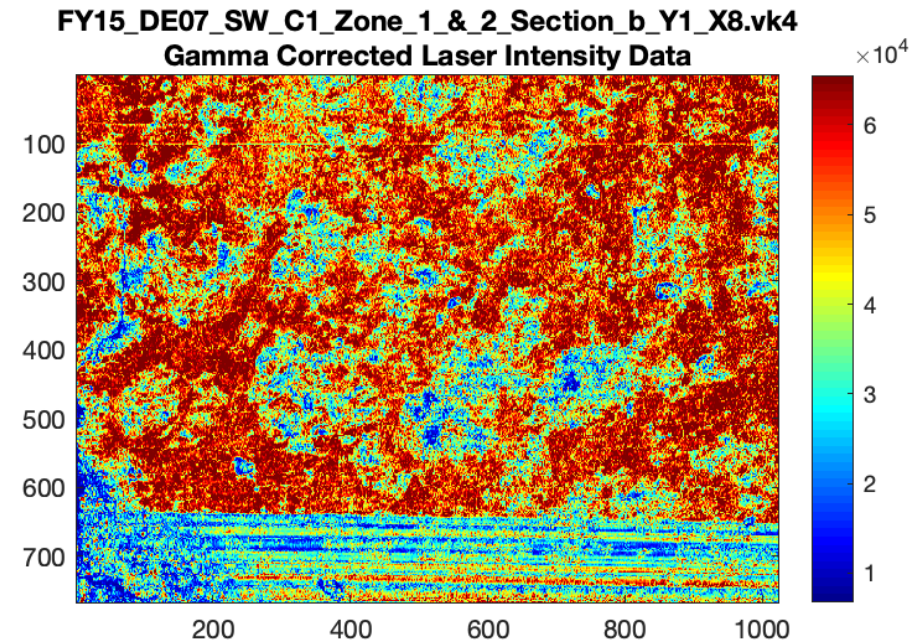


# Crack Strength of Image Y1X8, Intensity Data Strongest Select Image Ranking: 2, Strength: 887

**Crack Template Matches (black dots)**



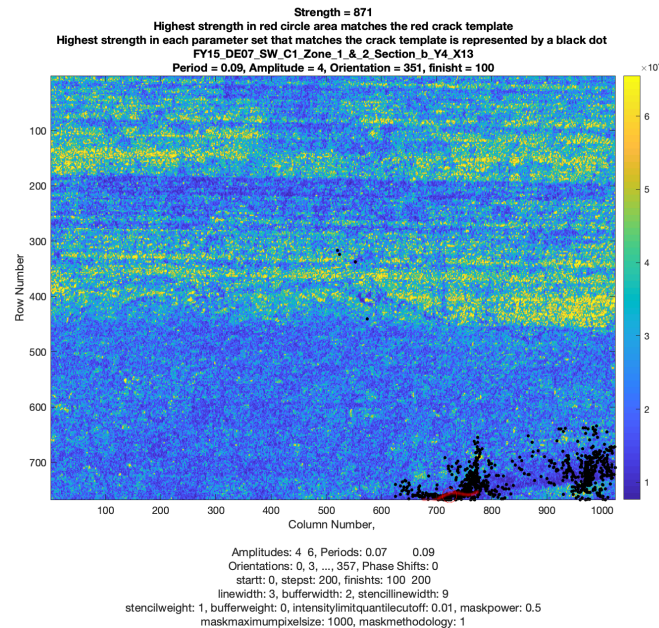
**Original Intensity Data (different scale)**



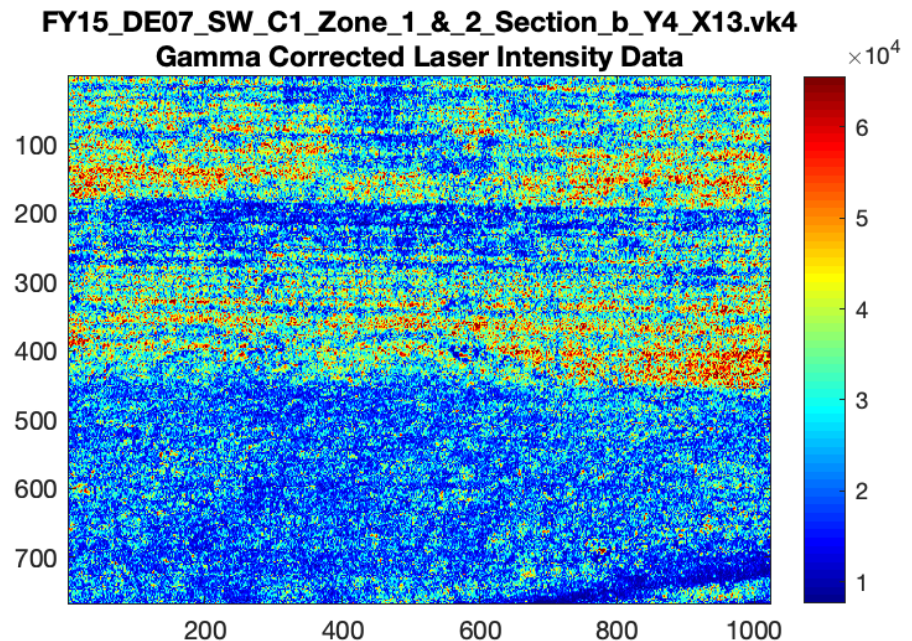


# Crack Strength of Image Y4X13, Intensity Data Strongest Select Image Ranking: 3, Strength: 871

**Crack Template Matches (black dots)**



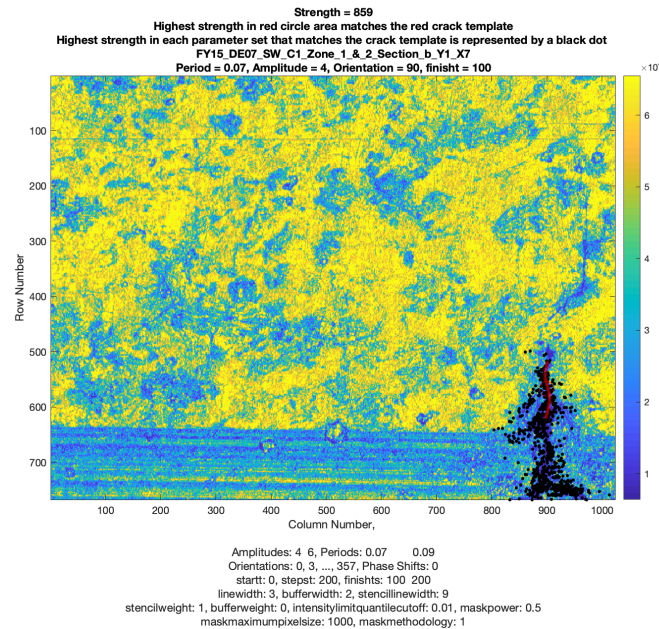
**Original Intensity Data (different scale)**



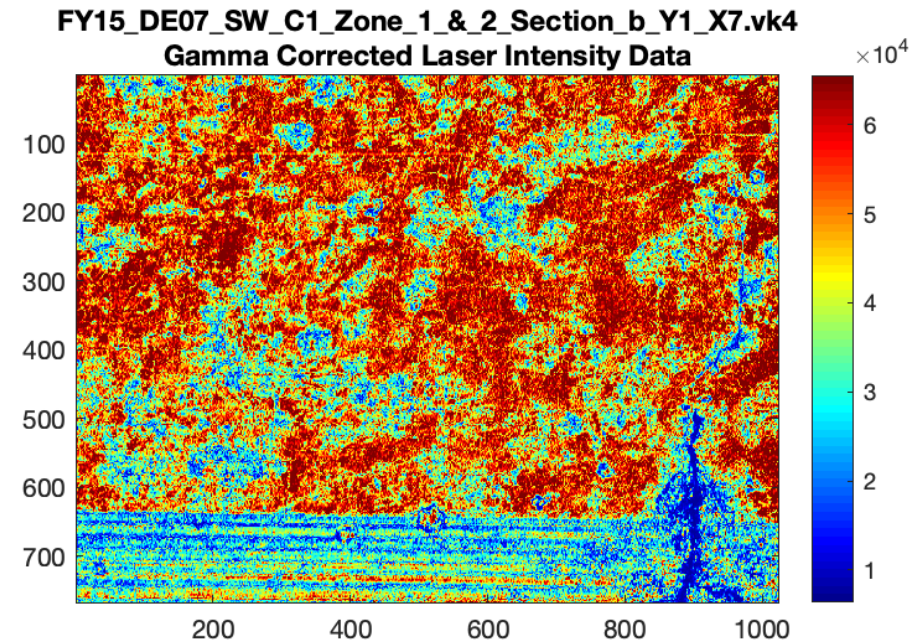
# Crack Strength of Image Y1X7, Intensity Data

## Strongest Select Image Ranking: 4, Strength: 859

**Crack Template Matches (black dots)**



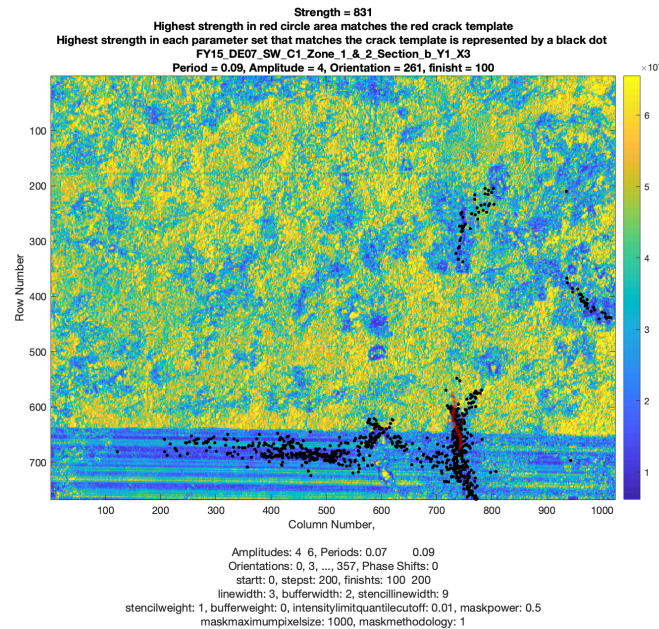
**Original Intensity Data (different scale)**



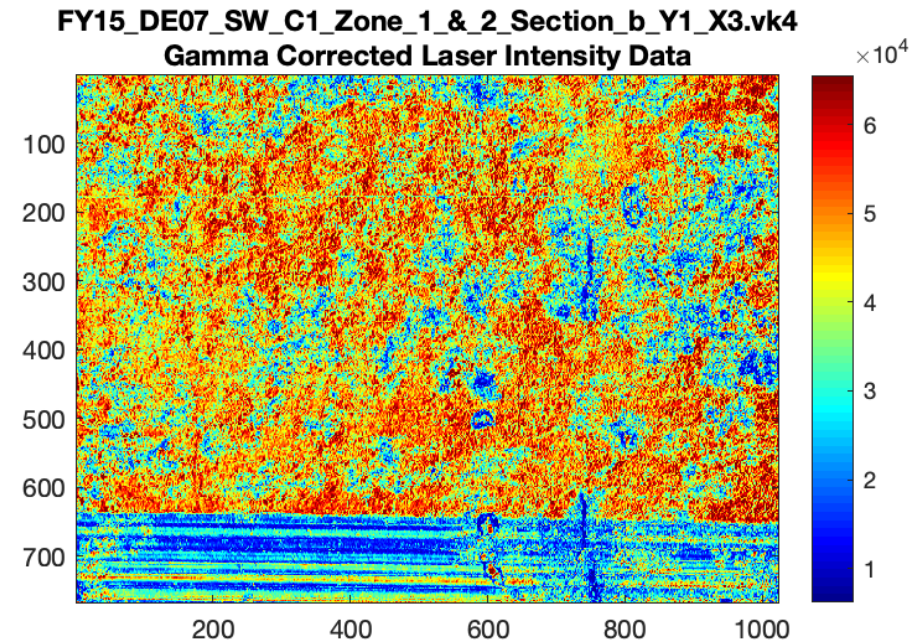


# Crack Strength of Image Y1X3, Intensity Data Strongest Select Image Ranking: 5, Strength: 831

**Crack Template Matches (black dots)**

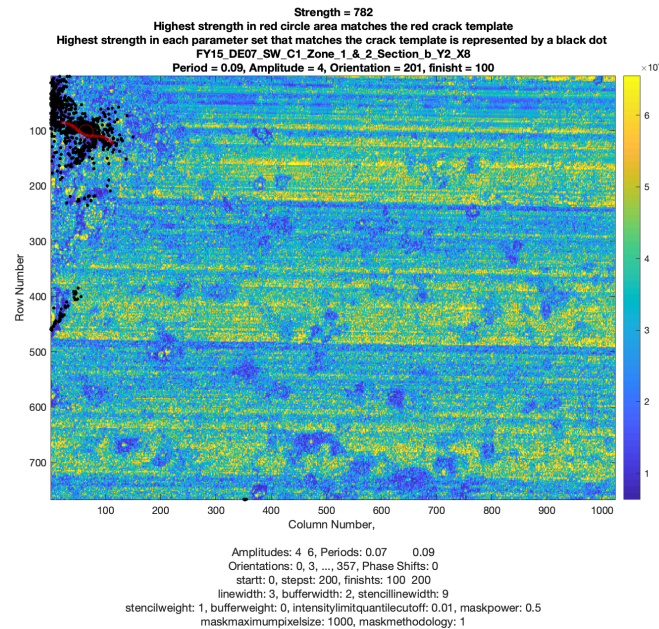


**Original Intensity Data (different scale)**

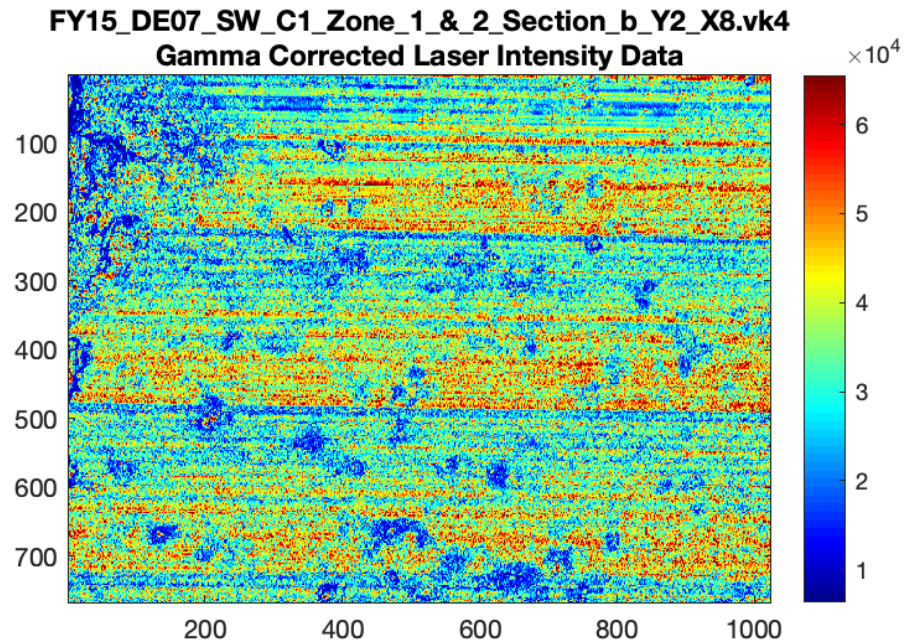


# Crack Strength of Image Y2X8, Intensity Data Strongest Select Image Ranking: 6, Strength: 782

Crack Template Matches (black dots)



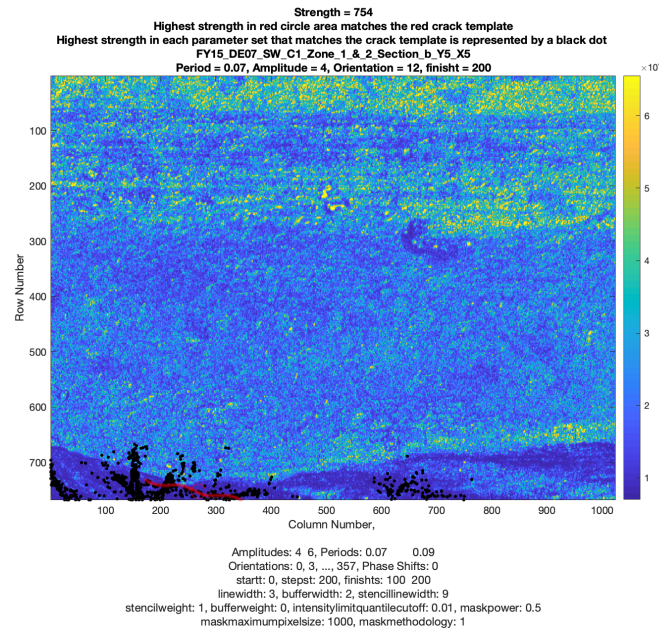
Original Intensity Data (different scale)



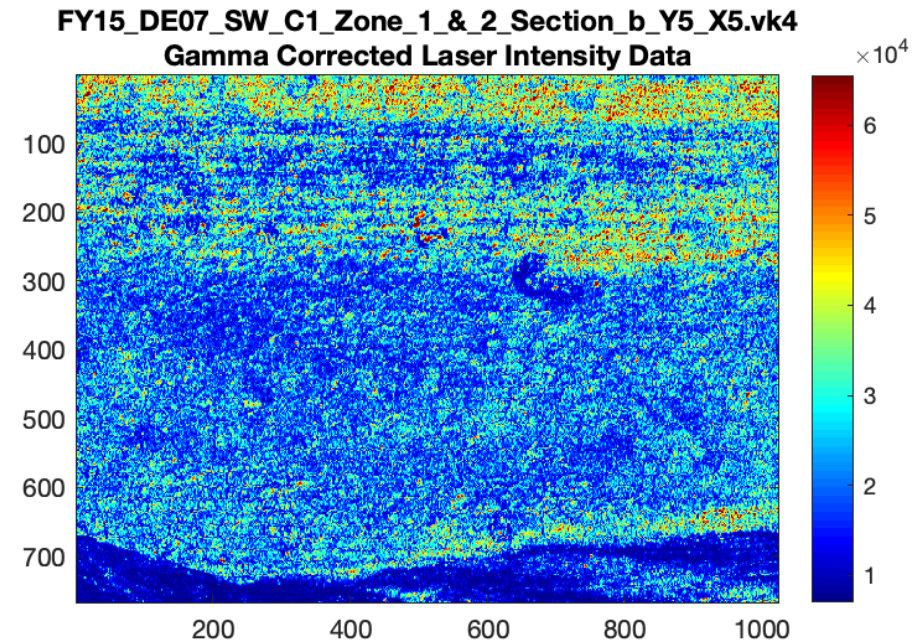


# Crack Strength of Image Y5X5, Intensity Data Strongest Select Image Ranking: 7, Strength: 754

**Crack Template Matches (black dots)**

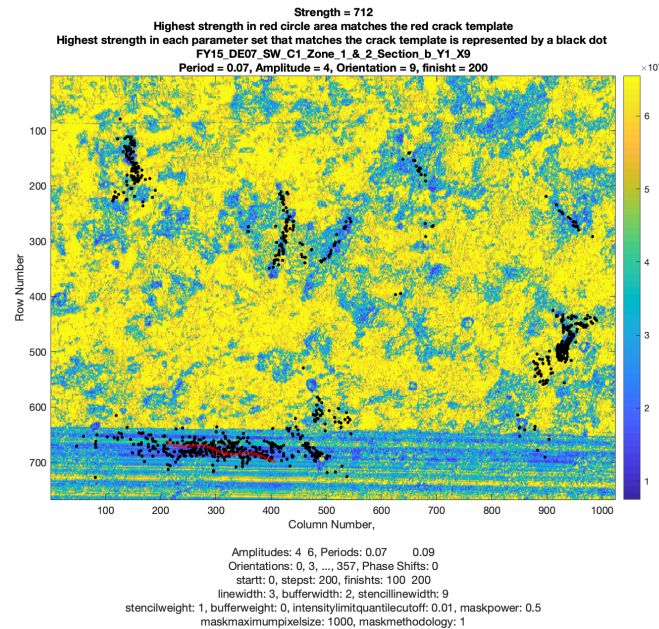


**Original Intensity Data (different scale)**

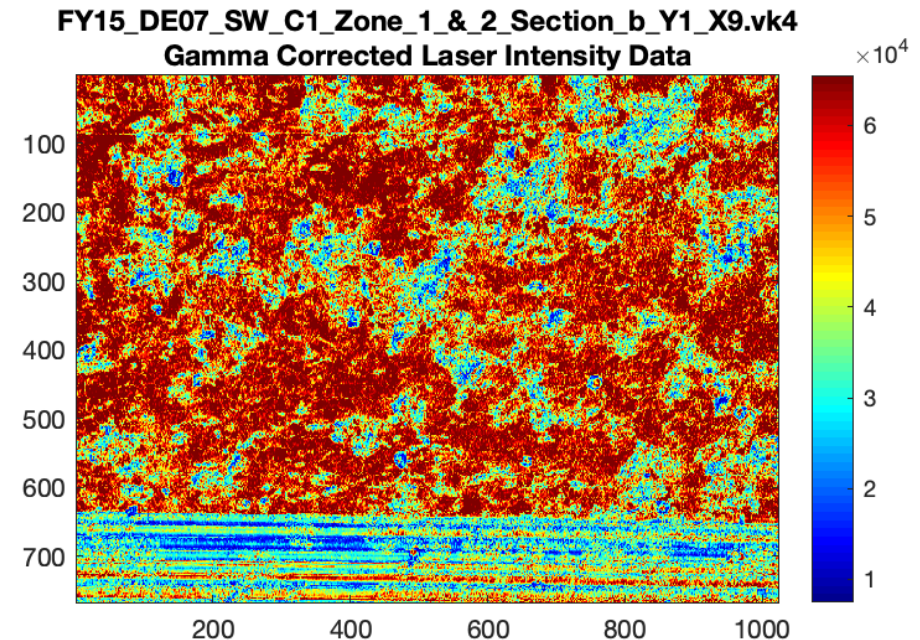


# Crack Strength of Image Y1X9, Intensity Data Strongest Select Image Ranking: 8, Strength: 712

**Crack Template Matches (black dots)**



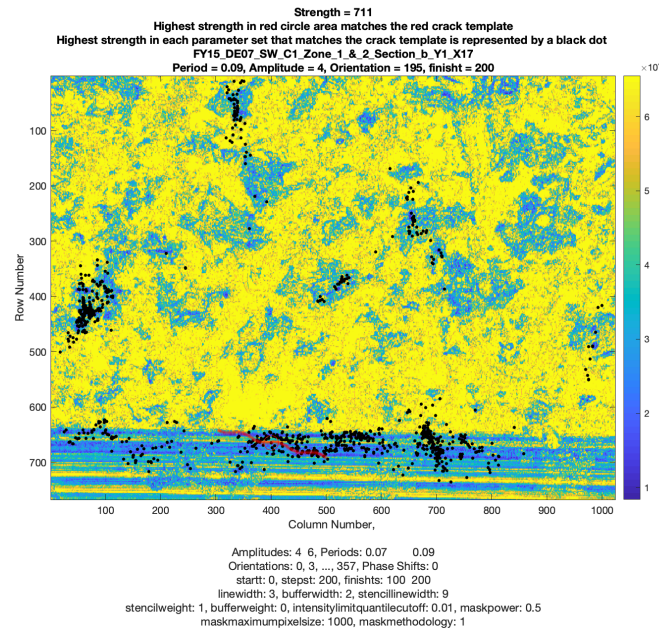
**Original Intensity Data (different scale)**



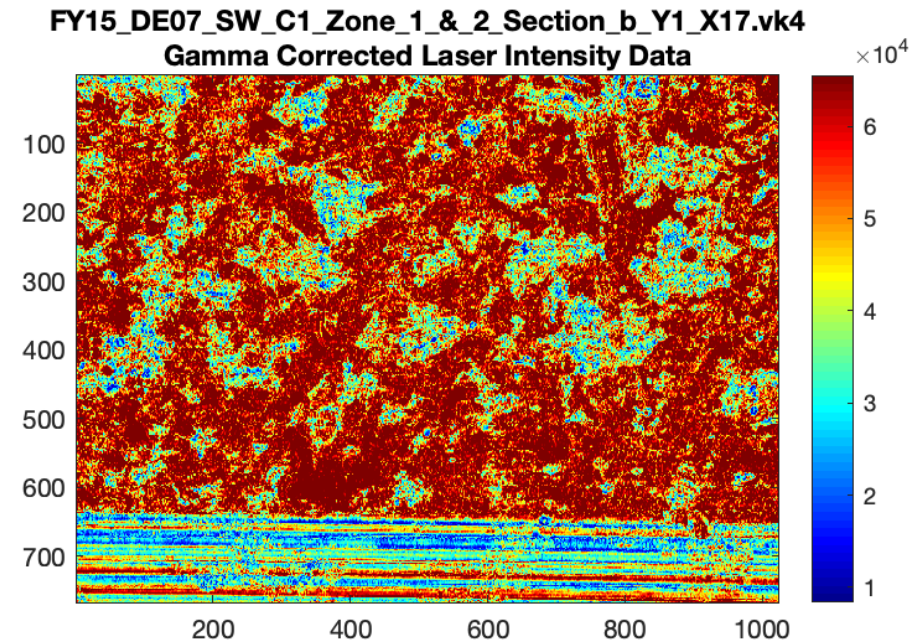


# Crack Strength of Image Y1X17, Intensity Data Strongest Select Image Ranking: 9, Strength: 711

**Crack Template Matches (black dots)**

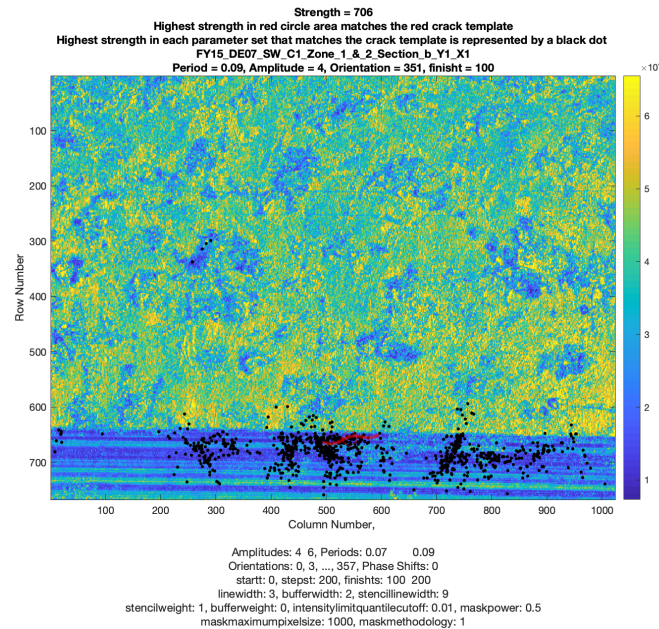


**Original Intensity Data (different scale)**

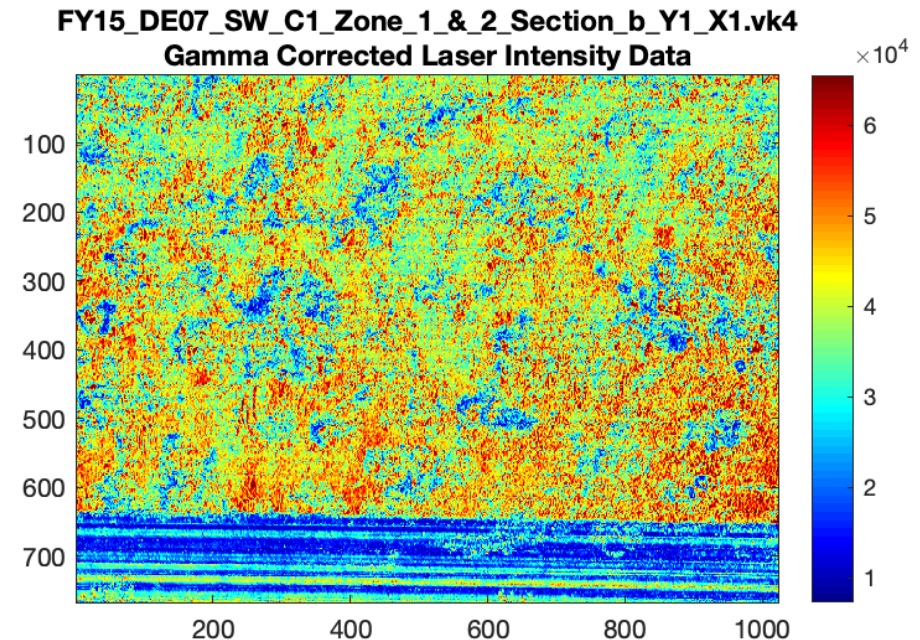


# Crack Strength of Image Y1X1, Intensity Data Strongest Select Image Ranking: 10, Strength: 706

**Crack Template Matches (black dots)**

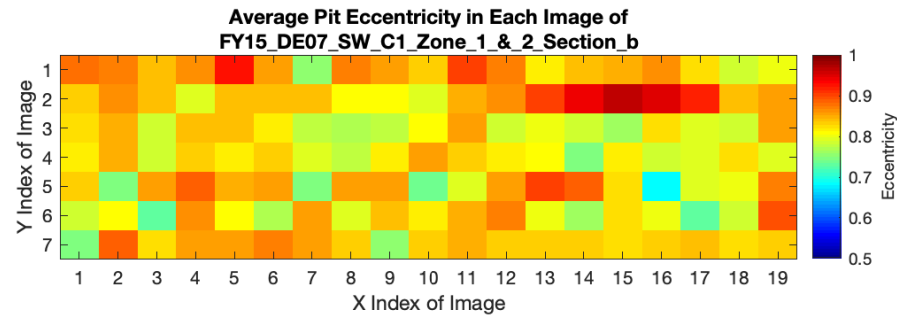


**Original Intensity Data (different scale)**

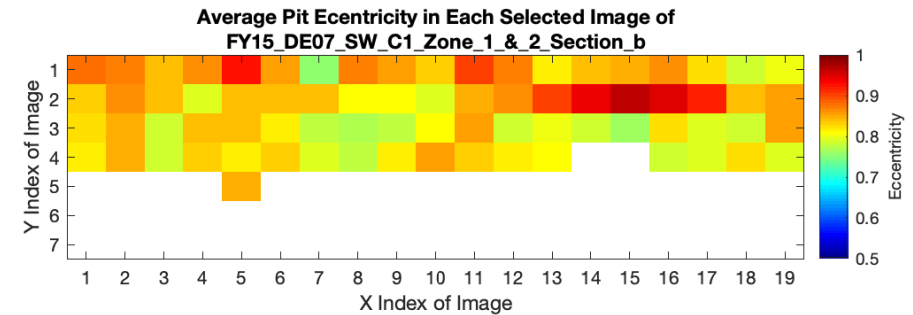


# Average Pit Eccentricity YX Key: Height Data FY15\_DE07\_SW\_C1\_Zone\_1\_&\_2\_Section\_b

## All Images

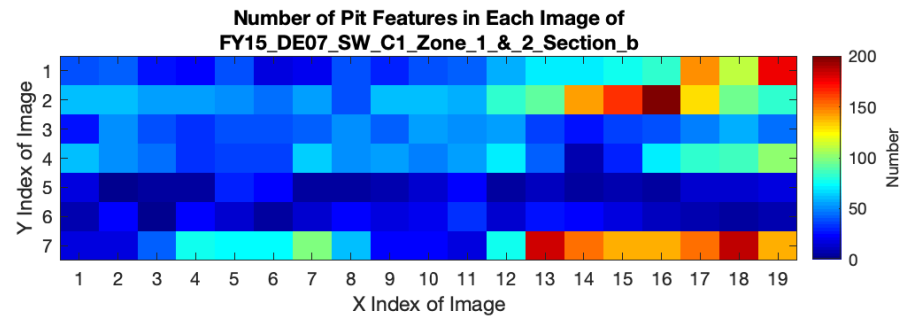


## Selected Images



# Pit Feature Density YX Key: Height Data FY15\_DE07\_SW\_C1\_Zone\_1\_&\_2\_Section\_b

## All Images



## Selected Images

